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Contents

ARTICLES

✓ Accident Clinic, The.....	SADIE M. SHELLOW.....	207
✓ Accident Proneness, Psychological Study of.....	ERIC FARMER.....	115
Achievement in College and in Later Life.....	T. A. LANGLEIE AND ASHTON ELDREDGE.....	450
Aid to the Selection of Pressman Appren- tices, An.....	O. MILTON HALL.....	77
Belgium, Vocational Guidance and Selection in..	A. G. CHRISTIAENS.....	322
Check on Character Analysis, A.....	ADELBERT FORD.....	121
College and Business, Success in.....	DONALD S. BRIDGMAN.....	1
Colleges, Progressive Developments in the.....	CHAUNCEY S. BOUCHER.....	20
Color Blindness in Dry Goods Salesmen.....	W. R. MILES AND HOMER CRAIG..	437
Common Colds.....	WILSON G. SMILLIE.....	470
Development of Personality at the College-Adult Level, The.....	R. A. BROTEMARKLE.....	455
✓ Disagreeable Job, The: Selecting Workers Who Will Not be Annoyed.....	O. MILTON HALL.....	297
✓ Emotional Crisis, A Monotonous Job in an.....	REX B. HERSEY.....	290
Foreman Training Material, A Source of.....	JOHN R. RICHARDS.....	281
German Industrial Inquiry, The.....	OTTO LIPMANN.....	86
Growth of an Employee Relations Research Study.	G. A. PENNOCK AND M. L. PUTNAM.	82
Health and Labor Turnover in a Department Store.	C. J. HO.....	216
Hotel Service, Training for.....	JOHN C. BURG.....	385
Induction of the New Executive.....	NATALIE KNEELAND.....	371
Industrial Government in the Book and Job Print- ing Industry.....	J. F. BOGARDUS.....	222
Interests, Outlook in the Measurement of.....	RESEARCH COMMITTEE UPON THE MEASUREMENT OF INTERESTS..	176
Interests and Scholastic Proficiency.....	T. A. LANGLEIE.....	246
Interviewing, Vocational Interest Blank as an Aid to.....	SADIE MYERS SHELLOW.....	379
Interviewing Industrial Employees: A Source of Foreman Training Materials.....	JOHN R. RICHARDS.....	281
Labor Turnover in a Department Store, Health and Light, The Visibility of Objects as Affected by Color and Composition of.....	C. J. HO.....	216
Measuring Leadership.....	C. E. FERREE AND GERTRUDE RAND.	475
Minimum Intelligence Levels for Several Occupa- tions.....	ELIZABETH H. MORRIS.....	124
✓ Monotonous Job in an Emotional Crisis, A.....	ALBERT SIDNEY BECKHAM.....	309
"Mortar Board" Graduates, Vocational Survey of	REX B. HERSEY.....	290
National Institute of Industrial Psychology, The British.....	Evelyn Rossetti Barbour.....	242
	C. SCARBOROUGH.....	327

Neutralizing Inequalities in Rating	ADELBERT FORD.....	466
New Executive, Induction of the.....	NATALIE KNEELAND.....	371
Ninth Annual Fall Conference of the Personnel Research Federation		359
Outlook in the Measurement of Interests	RESEARCH COMMITTEE UPON THE MEASUREMENT OF INTERESTS..	176
Personality at the College Adult-Level, The De- velopment of.....	R. A. BROTEMARKE.....	455
Personality Tests and Scholastic Attainment.....	A. R. GILLILAND AND WILLIAM H. VOAS.....	305
Personnel Research, What the Scientists are Doing in.....	ALBERT EDWARD WIGGAM.....	392
Personnel Research Federation in 1930: Annual Report of the Director.....	W. V. BINGHAM.....	251
Personnel Research Federation, Ninth Annual Fall Conference of		359
Pressman Apprentices, An Aid to the Selection of..	O. MILTON HALL.....	77
Printing Industry, Industrial Government in the..	J. F. BOGARDUS.....	222
Progressive Developments in the Colleges.....	CHAUNCEY S. BOUCHER.....	20
Psychological Study of Accident Proneness.....	ERIC FARMER.....	115
Rating, Neutralizing Inequalities in	ADELBERT FORD.....	466
Research Bureau for Retail Training, The.....	DAVID R. CRAIG.....	363
Scholastic Attainment, Personality Tests and.....	A. R. GILLILAND AND WILLIAM H. VOAS.....	305
Scholastic Proficiency, Interests and.....	T. A. LANGLEIE.....	246
Scoring Technique, A: For Tests Having Multiple Item-Weightings.....	PHILLIP JUSTIN RULON AND WES- LEY ARDEN.....	235
Skill and Specialization: A Study in the Metal Trades.....	MILDRED FAIRCHILD.....	28, 128
Store and School: Factors in the Success of De- partment Store Workers.....	CORA C. ALDERTON.....	314
Success in College and Business.....	DONALD S. BRIDGMAN.....	1
Time Questionnaire Study, A.....	MARIE G. ANDREWS.....	72
Training for Hotel Service.....	JOHN C. BURG.....	385
Visibility of Objects as Affected by Color and Com- position of Light, The. Part I. With Lights of Equal Brightness.....	C. E. FERREE AND GERTRUDE RAND.....	475
Vocational Guidance and Selection in Belgium...	A. G. CHRISTIAENS.....	322
Vocational Interest Blank as an Aid to Inter- viewing.....	SADIE MYERS SHELLOW.....	379
Vocational Survey of "Mortar Board" Graduates..	EVELYN ROSSETTI BARBOUR.....	242
What the Scientists are Doing in Personnel Re- search.....	ALBERT EDWARD WIGGAM.....	392
Worker's Mind Today, The.....	WHITING WILLIAMS.....	401

NEWS NOTES

Beloit College.....	185
Boston Elevated Railway.....	355
Boy Scouts Personnel Department.....	185
British Professorships in Industrial Relations	355

Bureau of Personnel Administration	261
Business and the Schools	263
Career Information for College Students	262
Carnegie Foundation	262
College Personnel Officers	262
Cotton-Textile Institute	355
Employee Superannuation	184
Experimental Employment Office	493
February Meetings in Detroit	408
Girl Scouts Rate Camps and Camp Directors	184
Graphic Arts Educational Center	93
Guide for Authors, A	494
Illness Among Wage Earning Adults	493
Industrial Psychology Literature Reviewed	408
Industrial Relations Counselors	261
Industrial Relations Section of Princeton University	407
Industry Report	95
Inquiry, The	261
International Conference of Industrial Psychology	410
International Industrial Relations Association	410
Journal of Higher Education	95
Mechanical Ability Tests	96
Nation-Wide Study of English Usage	185
National Institute of Industrial Psychology	408
New Vocational Guidance Department	494
Opportunities for Women in Personnel Work	408
Personal Items	
Anderson, V. V.	494
Angell, James R.	357
Beaumont, Henry	263
Beckman, R. O.	263
Benge, Eugene J.	357
Cattell, J. McKeen	186
Hincks, C. M.	494
Jackson, Florence	357
Kelley, Truman Lee	263
Manson, Grace E.	186
May, Mark A.	263
O'Connor, Johnson	357
Robertson, David Allen	263
Ruml, Beardsley	494
Shillady, John R.	357
Sparling, Edward J.	186
Uhrbrock, Richard S.	263
Works, George Alan	494
Yaglou, C. P.	357
Yoakum, C. S.	96
Personality Traits and Different Professions	262
Personnel Research Federation	
Activities of Member Organizations	92, 355, 407, 493
Annual Fall Conference	260
Placement and Personnel Officers	262
Printing Education	356

Regularizing Employment.....	184
Selecting Engineering Students.....	356
Selection by Photograph.....	96
Social Work Year Book.....	409
Stabilizing Employment.....	356
Suggested Research Topics in College Personnel.....	185
Summer Schools.....	96
Theological Education to be Surveyed.....	94
United States Public Health Service.....	261
University of Chicago Board of Vocational Guidance and Placement.....	93
University of Kentucky.....	409
University of Oregon.....	494
University of Pennsylvania.....	408
University of Pennsylvania Department of Industrial Research.....	92
University of Toronto.....	95
Vocational Service for Juniors.....	355
Wesleyan University Student Survey.....	95
Western Electric Company.....	93
Western Electric Company's Studies Translated.....	407
What Wage Earners Pay for Sickness.....	356
Women's Bureau of the U. S. Department of Labor.....	407
Young Men's Christian Association.....	355

BOOK REVIEWS

Atzler (editor): Körper und Arbeit, Handbuch der Arbeitspsychologie.....	DAVID P. BODER.....	502
Bezanson: Help-Wanted Advertising.....	L. D. HARTSON.....	99
Bezanson and Gray: Trends in Foundry Production.....	I. S. NOALL.....	102
Borden and Busse: The New Public Speaking.....	RICHARD S. UHRBROCK.....	268
Boring: A History of Experimental Psychology.....	DOUGLAS FRYER.....	414
Bowie: Education for Business Management.....	JOHN G. GLOVER.....	497
Bragdon: Counseling the College Student.....	THEODORE A. DISTLER.....	101
Burt: Psychology and Industrial Efficiency.....	A. H. DYON.....	97
Cohen: Principles and Practices of Vocational Guidance.....	WILLIAM M. PROCTOR.....	337
Crosland: The Psychological Methods of Word-Association and Reaction-Time as Tests of Deception.....	MARK A. MAY.....	266
Crowden: The Physiological Cost of the Muscular Movements Involved in Barrow Work.....	LELAND W. CRAFTS.....	193
Davies: Social Control of the Mentally Deficient.....	CHARLES W. MANZER.....	270
Dressler: Electrical Machinery and Industrial Engineering.....	I. S. NOALL.....	102
Dubreuil: Robots or Men? A French Workman's Experience in American Industry.....	MARGARET G. MYERS.....	264
Dunn: Labor and Automobiles.....	I. S. NOALL.....	102
Earle, Milner, and others: The Use of Performance Tests of Intelligence in Vocational Guidance.....	LELAND W. CRAFTS.....	193
Farmer and Chambers: A Study of Personal Qualities in Accident Proneness and Proficiency.....	LELAND W. CRAFTS.....	412

Frain: An Examination of Earnings in Certain Standard Machine Tool Occupations in Philadelphia	I. S. NOALL	102
Garrett: Great Experiments in Psychology	DOUGLAS FRYER	414
Gemmil: Present Day Labor Relations	MEYER BLOOMFIELD	192
Group Review: Sources of Vocational Information	HARRY D. KITSON	337
Hayes: Accounting for Executive Control	LEROY E. KIMBALL	190
Hill: An Investigation Into the Sickness Experience of Printers	LELAND W. CRAFTS	193
Hill: Readings in Vocational Life	FRANKLIN J. KELLER	332
Holbrook and McGregor: Our World of Work	DANA Z. ECKERT	335
Hutchins: Labor and Silk	I. S. NOALL	102
Jastrow: Piloting Your Life	JOSEPH V. HANNA	335
Jones: Principles of Guidance	GEORGE E. MYERS	336
Lipmann: Grundriss der Arbeitswissenschaft und Ergebnisse der Arbeitswissenschaftlichen Statistik	MAX F. HAUSMANN	417
Lytle: Wage Incentive Methods, Their Selection, Installation and Operation	HAROLD E. BURTT	187
Murchison: A History of Psychology in Autobiography	DOUGLAS FRYER	414
Murchison: Psychologies of 1930	DOUGLAS FRYER	414
Myers, Little and Robinson: Planning Your Future	FRANKLIN J. KELLER	332
Patterson: Social Aspects of Industry	MEYER BLOOMFIELD	100
Phelps: Tomorrow's Advertisers and Their Advertising Agencies	I. S. NOALL	102
Platt: The Manual of Occupations	DON H. TAYLOR	334
Princeton University, Industrial Relations Section: The Labor Banking Movement in the United States	MARGARET G. MYERS	191
Rankin: Trends in Educational Occupations	KARL M. COWDERY	498
Reed: The Labor Philosophy of Samuel Gompers	MARIE SWABEY	502
Schwenning: Management Problems. With Special Reference to the Cotton Textile Industry	EDWARD S. COWDRICK	411
Sheehy: Problems of Student Guidance	THEODORE A. DISTLER	101
Smith and Blough: Planning a Career	DON H. TAYLOR	334
Sowton and Myers: Two Contributions to the Experimental Study of the Menstrual Cycle. I. Its Influence of Mental and Muscular Efficiency. Bedale: II. Its Relation to General Functional Activity	LELAND W. CRAFTS	193
Stockwell: Introduction to Business Management	DWIGHT FARNHAM	416
Stratton: Social Psychology of International Conduct	KIMBALL YOUNG	268
Sturtevant and Strang: A Personnel Study of Deans of Girls in High Schools	KARL M. COWDERY	265
Taylor: Significant Post-War Changes in the Full-Fashioned Hosiery Industry	I. S. NOALL	102
Taylor Society: Scientific Management in American Industry	EDWARD S. COWDRICK	189

Advertising Federation of America: The Advertising Men of Detroit	RICHARD S. UHRBROCK.....	268
Vernon and Bedford: A Study of Absenteeism in a Group of Ten Collieries	LELAND W. CRAFTS.....	193
Vernon and Vernon: A Physiological Investigation of the Radiant Heating in Various Buildings...	LELAND W. CRAFTS.....	193
Vernon and Vernon: Two Studies on Hour of Work: I. Five-Hours Spells for Women. With Reference to Rest Pauses. Smith and Vernon: II. The Two-Shift System in Certain Factories.	LELAND W. CRAFTS.....	193
Watson: A Source Book for Vocational Guidance...	FRANKLIN J. KELLER.....	332
Webb and Morgan: Strategy in Handling People.	JOHN M. BREWER.....	501
Wells: Individuality and Social Restraint.....	KIMBALL YOUNG.....	268
Werner: Every College Student's Problems.....	THEODORE A. DISTLER.....	101
Weston and Adams: Further Experiments on the Use of Special Spectacles in Very Fine Processes.....	LELAND W. CRAFTS.....	412
Weston and Adams: On the Relief of Eyestrain Among Persons Performing Very Fine Work..	LELAND W. CRAFTS.....	193
White and Smith: The Prestige Value of Public Employment.....	L. D. HARTSON.....	99
Wiggam: The Marks of an Educated Man.....	JOHN W. HERRINGO.....	496
Wrinne: Elements of Journalism	I. S. NOALL.....	102
Wyatt and Fraser: The Comparative Effects of Variety and Uniformity in Work.....	LELAND W. CRAFTS.....	193
Wyatt, Fraser, and Stock: The Effects of Monotony in Work.....	LELAND W. CRAFTS.....	412
Young: Books.....	I. S. NOALL.....	102

BOOK REVIEWS—BRIEFER MENTION

Pages 105, 195, 270, 342, 421, 503

NEW BOOKS

Pages 106, 197, 273, 344, 426, 505.

CURRENT PERIODICALS

Pages 109, 201, 275, 347, 429, 509

CONTRIBUTORS

Leading Articles are marked (A) and Reviews (R)

Alderton, Cora C.....	314 (A)	Brotemarkle, R. A	455 (A)
Andrews, Marie G.....	72 (A)	Burg, John C.....	385 (A)
Arden, Wesley.....	235 (A)	Burt, Harold E.....	187 (R)
Barbour, Evelyn Rossetti.....	242 (A)	Christiaens, A. G.....	322 (A)
Beckham, Albert Sidney.....	309 (A)	Cowdery, Karl M.....	265 (R), 498 (R)
Bingham, W. V.....	251 (A)	Cowdrick, Edward S.....	189 (R), 411 (R)
Bloomfield, Meyer.....	100 (R), 192 (R)	Crafts, Leland W.....	193 (R), 412 (R)
Boder, David P.....	502 (R)	Craig, David R.....	363 (A)
Bogardus, J. F.....	222 (A)	Craig, Homer.....	437 (A)
Boucher, Chauncey S.....	20 (A)	Distler, Theodore A.....	101 (R)
Brewer, John M.....	501 (R)	Dyon, A. H.....	97 (R)
Bridgman, Donald S.....	1 (A)	Eckert, Dana Z.....	335 (R)

Eldredge, Ashton	450 (A)	Miles, W. R.	437 (A)
Fairchild, Mildred	28 (A), 128 (A)	Morris, Elizabeth H.	124 (A)
Farmer, Eric	115 (A)	Myers, George E.	336 (R)
Farnham, Dwight	416 (R)	Myers, Margaret G.	191 (R), 264 (R)
Ferree, C. E.	475 (A)	Noall, I. S.	102 (R)
Ford, Adelbert	121 (A), 466 (A)	Pennoek, G. A.	82 (A)
Fryer, Douglas	414 (R)	Proctor, William M.	337 (R)
Gilliland, A. R.	305 (A)	Putnam, M. L.	82 (A)
Glover, John G.	497 (R)	Rand, Gertrude	475 (A)
Hall, O. Milton	77 (A), 297 (A)	Research Committee upon the Meas- urement of Interests	176 (A)
Hanna, Joseph V.	335 (R)	Richards, John R.	281 (A)
Hartson, L. D.	99 (R)	Rulon, P. J.	235 (A)
Hausmann, Max F.	417 (R)	Scarborough, C.	327 (A)
Herring, John W.	496 (R)	Shellow, Sadie M.	207 (A), 379 (A)
Hersey, Rex B.	290 (A)	Smillie, Wilson G.	470 (A)
Ho, C. J.	216 (A)	Swabey, Marie	502 (R)
Keller, Franklin J.	332 (R)	Taylor, Don H.	334 (R)
Kimball, LeRoy E.	190 (R)	Uhrbrock, Richard S.	268 (R)
Kitson, Harry D.	337 (R)	Voas, Wm. H.	305 (A)
Kneeland, Natalie	371 (A)	Wiggam, Albert Edward	392 (A)
Langlie, T. A.	246 (A), 450 (A)	Williams, Whiting	401 (A)
Lipmann, Otto	86 (A)	Young, Kimball	268 (R)
Manzer, Charles W.	270 (R)		
May, Mark A.	266 (R)		

Success in College and Business¹

BY DONALD S. BRIDGMAN, *American Telephone and Telegraph Company*

Does business want athletes, debaters and glee-club leaders as well as scholars? And what about the man who earns his way through college?

The Bell System, one of the largest employers of college graduates, here reports the relation of progress in that organization to student earnings, participation in activities, and scholarship rank.

This paper presents the results of studies of the success of college graduates in the Bell Telephone System in relation to a number of factors in their college life. Present salary, related to the number of years since graduation and weighted to eliminate geographical variations, is used as the criterion of success. Within a unified organization such as the Bell System it may be considered as an excellent index. There is some evidence that selective losses from the groups studied have not greatly influenced the results obtained.

Information concerning all the elements studied was available for 1310 graduates four or more years out of college who had spent at least half the time since graduation in the Bell System. Scholarship information alone had been obtained for a considerably larger number of men and the results of its analysis were published in an article "Does Business Want Scholars?" by W. S. Gifford, President of the American Telephone and Telegraph Company, in Harper's Magazine for May, 1928.

The results of the present study indicate that high scholarship, substantial campus achievement, early graduation and immediate employment in the Bell System are significantly favorable factors for success in its work. Earning of college expenses appears to be a neutral factor. In general these factors are independent of one another, although high scholarship and early graduation often occur together as well as late graduation and large earnings in college. Scholarship appears to be the most significant single index of success. The combination of favorable factors such as high scholarship and substantial campus achievement increases the likelihood of success but by no means

¹ Paper delivered before the Joint Meeting of Organizations Interested in Personnel and Vocational Guidance under the auspices of the Personnel Research Federation, Atlantic City, February 22, 1930.

assures it in all cases. It is clear that each man's interest in his work, the satisfaction of his basic motives through it and his ability to adjust himself to his environment are also most important elements in his success. Proper self-analysis and guidance in the choice of a vocation are essential to it.

Part I. Introduction

THE prediction of success or failure in business for men entering it on graduation from college is an extremely hazardous undertaking. The inter-actions of all the factors influencing them make it a problem of the most complex sort. One major difficulty arises from the very different environments faced by men in college and after graduation. If, however, the colleges are not failing seriously in at least one of their major purposes, men who are successful in them should be more likely to succeed later.

But college success is not measured by a single yardstick. Some men are high-rank scholars, others are editors of college magazines, managers of teams, great athletes. Still others satisfactorily complete the requirements for the degree while overcoming the most severe financial handicaps. Are any of these accomplishments more indicative than others of business success or do none of them give a clue to it?

To answer such questions as these was one purpose of the Bell System in establishing five years ago a centralized record of all college graduates in its companies. Such a record would be extremely useful for administrative purposes. It would permit the study of salary progress of graduates in the several companies and departments.

From it, studies of their losses could be made. Its value would be unquestionable if it also assisted in improving the means by which the right men for the telephone business could be selected.

In employing college graduates some stress had been placed on their scholarship, on their participation in campus activities and on their earnings in colleges. There was, however, no definite data indicating that these were indices of success in the telephone business. To make quantitative studies of the relations between these factors and such success seemed distinctly important. Beyond this, it was hoped that such studies would be of interest and possible value to education itself.

The Bell System Companies together are probably the largest single employers of college graduates in the country. It, therefore, had a rather unique opportunity to study the progress of graduates in its employ in relation to their achievements of various kinds in college. A centralized record was therefore set up in 1925 in the personnel department of the American Telephone and Telegraph Company under the direction of Mr. E. K. Hall. Soon afterward it seemed worth while to attempt an immediate study of the relation between college scholarship and success in the Bell System.

Those colleges from which a number

of graduates had come to the System were, therefore, asked to furnish their scholarship records. From them, such a study was carried out and its results were published in the article "Does Business Want Scholars?" by W. S. Gifford, President of the American Telephone and Telegraph Company in Harper's Magazine for May 1928. This article did arouse a considerable amount of interest among educational people. Spontaneous requests were received for about 25,000 reprints of it and these were distributed.

It is likely, however, that it enhanced the Bell System's popularity with college authorities somewhat more than with college students. In fact, there was one case where a boy had been in some minor scholastic diffi-

culty. When the telephone representatives visited the campus one of them gave this boy a copy of Mr. Gifford's article. He said, "Thank you, but do I have to read this. You see last weekend I was at home and father gave me one of these and then Tuesday I was talking with the dean and he gave me one also."

The interest aroused by this article was so great that it seemed worth while to undertake other studies immediately based on records of campus activities, student earnings in college and other factors which might be readily available. Information concerning these factors on a substantial number of men has therefore been obtained and the present paper reports this study in full.

Part II. General Problems and Study of Two Individual Factors

THE METHODS EMPLOYED

The first general problem to be considered in developing such a study is that of method which naturally breaks down into a number of minor problems. The first of these involves the criterion of success to be used. It was decided to use salary as compared with years since graduation as this criterion. It is recognized that this is not a perfect measure of success, but in an organization like the Bell System with consistent salary standards it is likely to parallel success very closely.

Although Bell System salary standards throughout the country are consistent, they are not uniform. It was therefore necessary to compensate for different standards due to economic

conditions in different parts of the country. This was done by finding the medians for all the men covered by geographic areas and weighting individual salaries to a common base in accordance with the differences thus found. It was also felt that salary should be measured against years since graduation rather than years of service in the Bell System. All cases of men who had spent less than half of their working life in the Bell System were excluded entirely, however, and of those included, about 60 per cent entered its work during the year in which they completed college.

A second problem arises from differing college standards, different sizes of institutions, and similar variations.

These difficulties were avoided to some extent in the study of scholarship by relating men to their own groups. The colleges were not asked whether a man had an average record of 90 or 70 but whether he had been in the first tenth of his class (as such a group would distinguish the exceptional men) and if not, whether he had been in the first third, middle third or lowest third. In other words, was he distinctly above average, average or below average? In a sense this ignores the differing standards of institutions except in recognizing that due to them a larger number of ranks would probably be artificial.

For campus activities a definitely relative scale was impracticable. On the other hand, the competitive nature of campus activities makes any record of them somewhat relative. In the study, therefore, achievement in campus activities was determined on the basis of actual offices, team membership, etc., which each man held. Consistency of judgment in this classification was insured by making it from the year books of the institutions almost entirely by a single person using objective standards previously set up.

In the case of earnings of college expenses an absolute proportion of expenses earned was determined by a questionnaire sent to the men on whom we already had scholarship and campus activity information. From this questionnaire a very high percentage of return was received. The replies to it undoubtedly present a thoroughly valid picture of the degree to which the men covered earned their way through college as a result of work carried on during the four years of

their college course during both term time and their vacation periods.

The final and most difficult problem of a method was that of expressing any relationships which might be found between success and college achievement. To present such a study without a single sigma or, worse, even a correlation co-efficient is extremely hazardous. Good statisticians, however, agree that it is not illogical to avoid this usual method of expressing relationships because of the small number of ranks available without unwarranted artificialities and because with salary data that method is likely to give rather unreliable results due to the large variations from the average salary in a few cases. For these reasons a much less technical method of analysis has been used.

First of all medians were drawn both for each of the entire groups studied and for the groups selected by scholarship rank, campus achievement, etc. This method was only useful where the selected groups were fairly large and medians could rather accurately be determined. In the case of smaller selected groups, their salary distribution was compared with the salary distribution of the entire group from which they were taken.

GENERAL VALIDITY OF RESULTS

Before attempting to show the actual results obtained, some discussion of their general validity is probably worth while. Of course, these results are valid for the Bell System only. They must be interpreted in the light of the qualities which are likely to make for success in it. Quite different results might very well be obtained for a different type of business. In the

Bell System, as in other businesses, success does often require leadership of large groups of men and women or the ability to make effective public contacts. Greater emphasis, however, is placed in it on the ability to develop careful methods, to analyze thoroughly the results obtained than on high pressure salesmanship or the intuitive grasp of immediate situations.

The validity of the results depends also on the size of the groups studied. The scholarship study was made first with about 1000 cases, then for about 1500 and finally for about 3800. Almost identical results were obtained with each of these groups. All of the main groups, therefore, seem large enough to give reliable results. About some of the highly selected groups there is considerably more question.

The validity of the results may also be criticized because they are drawn from the study of a group which has been specially selected for a single industry and has remained in that industry. The influence of selection, however, may cause relationships which are less striking than those for a random group. As high scholarship and substantial campus achievement have been used as criteria of selection, when either or both are absent other compensating qualifications have been demanded.

The selective effect of losses cannot, however, be measured at all accurately. This is partly because most of these losses occur during the first year or two before there is available objective evidence in terms of salary concerning the probable success or failure of the men in question. It is partly due also to the fact that there is no record of

men who left more than five years ago. The distributions of the older and younger men at least by scholarship are quite comparable, however, and, among the more recent classes, the distributions by scholarship and other campus achievements of the men who have left and of those who remain are about equal. The causes of separation thus seem not at all closely related to these college factors. Such phenomena, therefore, as the retention of high scholarship men doing well and the loss of those doing poorly or the loss of low scholarship men doing well and the retention of these doing poorly have probably affected the results very little.

SUMMARY OF STUDY OF SCHOLARSHIP

With this general discussion as a basis, it now seems feasible to go directly to the charts which illustrate the results obtained from these studies. The first figure "Median Salaries by College Scholarship Rank" of 3806 graduates in the Bell System is taken directly from Mr. Gifford's article in Harpers. In this chart the 100 per cent horizontal line represents the median of the entire group studied in terms of the years since graduation. The top line represents the median of 498 men who were in the first tenth of their classes, the next one that of 1554 in the first third of their classes, etc. It is interesting to note that this group is somewhat better than a cross section of those classes. About 14 per cent of the men came from the first tenth of their classes, about 40 per cent from the first and middle thirds and only about 20 per cent from the last third.

Fifteen years after graduation the

median of the first tenth men is 20 per cent above that for the whole group, 25 years after graduation it is 40 per cent and 30 years after graduation it is nearly 60 per cent. The median of the first third rises steadily but rather slowly and only approaches 20 per cent above the entire group median at 25 years after graduation, and is only slightly above it at 30 years after.

this case the men studied were classified into three groups, those with substantial campus achievement, those with some achievement and those with no achievement. Some achievement in this classification indicates a member of the editorial board of a magazine, the manager of a minor team or magazine, a minor class officer or the member of a social fraternity, the member

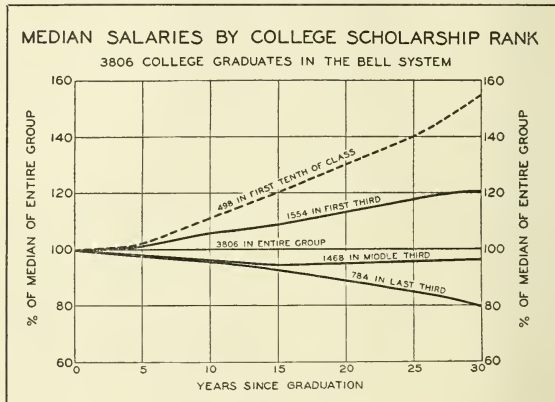


FIG. 1

The median of the middle third is somewhat below the median of the whole group and that of the last third falls rather steadily until at 30 years after graduation it is only 80 per cent of that of the whole group.

THE INFLUENCE OF CAMPUS ACHIEVEMENT

Figure 2 shows the median salaries by campus achievement groups. In

of a minor athletic team or of a major varsity squad, or finally a member of a dramatic or musical club.

Substantial achievement indicates the editor-in-chief of a magazine, the winner of an important oratorical contest or member of an important debating team, the manager of a major team or important student newspaper, a major class officer or member of an honorary senior society, or the leader

of a dramatic or musical club. It also indicates some achievement in two or more fields, not including fraternity membership. That is, a man who is on the board of a paper and on a minor team would be regarded as having won substantial campus achievement but a man who was on the board of a magazine and was merely a fraternity

carried only to 25 years after graduation as there were not enough cases after that point to warrant drawing them further. The median for men with the substantial achievement reaches 20 per cent above that for the whole group at the 25 year point. This is about what the median for the first third men in scholarship did. It

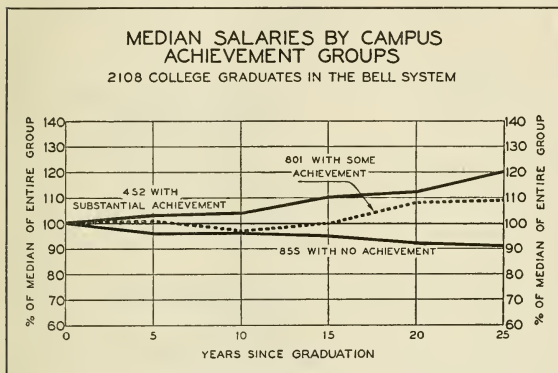


FIG. 2

member in addition would not be so regarded. On the basis of this classification we find that 21 per cent of the 2108 men covered by this study were classified as winners of substantial campus achievement, 38 per cent as winners of some campus achievement and 41 per cent as those with no campus achievement.

The medians in this chart have been

must be remembered in comparing them, however, that this group comprises only 21 per cent of the entire group studied whereas the first third men in scholarship made up about 40 per cent of that entire group studied. Furthermore, the median for the first tenth men in scholarship comprising 14 per cent of the men studied, at 25 years after graduation is 40 per cent

above that for the whole group. On the basis of this evidence alone it seems that high scholarship is a rather more significant factor than substantial campus achievement.

Figure 2 locks together achievement in a number of different fields. It is,

ment by determining what proportion of the men with each type of achievement stood above and below the median salary of the entire group studied including those with no campus achievement. The A and B bars on this chart stand respectively for those

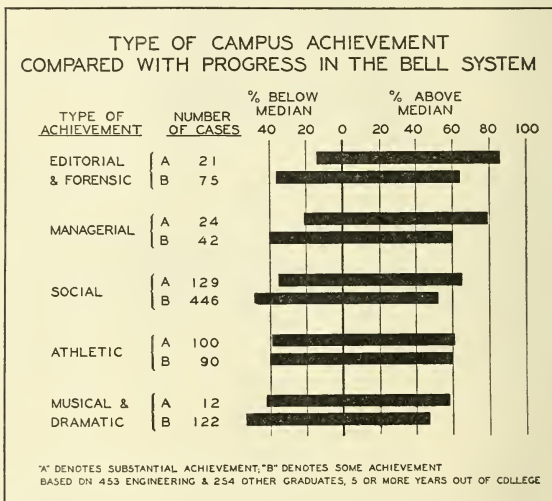


FIG. 3

of course, recognized that these fields are exceedingly diverse and that achievement in one of them may be distinctly more significant than achievement in some other one. Figure 3, therefore, compares the significance of the various types of achieve-

ment with substantial and those with some achievement in the various fields. Examination of it indicates that for the men with substantial achievement the order of significance seems to be editorial and forensic achievement, managerial achievement, social achieve-

ment, athletic achievement and finally musical and dramatic achievement.

Some of these groups are distinctly small but the general rank seems to be rather well borne out by the fact that the B bars also range in about the same order. The exceptions to this are in the case of social and athletic achievement but that seems to be due to the nature of those particular activities. The B bar under social achievement is largely made up of those who are merely fraternity members. The two bars for athletic achievement indicate that while it is distinctly a favorable factor, it makes relatively little difference whether a man is a member of a major team or merely a minor team or varsity squad. The only type of activity which seems to be at all unfavorable is musical and dramatic achievement without the achievement of definite leadership in it, but even here the degree of negative correlation is distinctly small.

In view of the results obtained in the study of scholarship it is distinctly interesting that the most significant type of achievement by this analysis seems to be a rather intellectual type, namely literary and forensic achievement. With outstanding achievement in this field good scholarship is also usually present; with some achievement in it, somewhat better than average scholarship. The managers, on the other

hand, particularly those of major activities, are rather below average in scholarship. On the whole, however, the type of campus achievement does not seem to be very closely related to scholarship.

THE INFLUENCE OF CURRICULA

One interesting point should be mentioned here. The type of curriculum seems to have no influence at all on the significance of scholarship. Almost identical results were found for men who had graduated in engineering and those who had graduated in other courses, mainly arts and science. In the case of campus achievement, however, this was found to be true. Substantial achievement was rather less significant, although a favorable factor, for men of engineering training, than it was for men of training in arts and science. Some campus achievement, on the other hand, was rather more significant for the men of engineering training than it was for the men in arts and science. It may well be that the engineering student who spends a great deal of time in extra curricular activities may thereby neglect his college work to such an extent that it affects his future success or, on the other hand, it may be that men who are not particularly interested in their engineering work compensate for that by undue activity in other fields.

Part III. The General Study of Several Factors

INTRODUCTION

The material presented so far deals with single factors, and it has been based on somewhat different groups. It now seems useful to take a single

group for which are known the scholarship, extra curricular achievement, degree of college earnings and other facts about the men and compare the effects of single factors and of combina-

tions of factors in this group. For such a group it was possible to obtain data on 1310 cases, of whom all the men were four or more years out of college. At this point there seems to be sufficient spread in the salaries received to warrant beginning the study there. Below it the spread is rather narrow and salary differences may be based on somewhat temporary factors.

In the study of this group to the three primary elements of college life, namely study, campus activities and, where necessary, the earnings of one's expenses, two others which were readily available were added, the age at graduation and time of employment in the Bell System relative to data of graduation. The latter, of course, is not strictly a college factor but it does bring out one point which seems worth making.

INTER-RELATIONS OF FACTORS

Of course, to estimate the significance of these several factors it must be known whether or not they are independent of one another, whether the same men are both good scholars and outstanding men on the campus, or are distinctly not the same men and whether men earning a large part of their way through college are therefore unable to take part in campus activities.

Figure 4 illustrates a method of analyzing these relationships. The first set of bars studies the distribution by extra curricular achievement of those men who have earned a large part of their way through college and those who have earned a small part or none of it. It seems to indicate a very slight inter-relationship between these

two factors in that a slightly smaller proportion than normal of the men who earned over two-thirds of their way through college were able to win substantial achievement in campus activities. On the whole, however, these two factors seem surprisingly independent. This, of course, may be due to the fact that in some cases men earn their way through college by campus activities. For example, the editor or business manager of a paper may have made money in that way. In other cases it may even have been true that athletes obtained paid sinecures.

In studying all of the other pairs of factors not illustrated on the chart the inter-relationships were found to be less than that for earnings and campus achievement. They may be regarded, therefore, as practically independent of one another.

The two remaining sets of bars on this chart, however, do show a fairly substantial degree of inter-relationship. Thus, of the men who earned more than two-thirds of their way through college, a relatively small proportion of the group were 20 and 21 years old on graduation and a relatively larger proportion of those men were 24 and over. In fact 31 per cent of the men who earned over two-thirds of their way through college were 24 or over and but 15 per cent of those who earned none of it.

In the same way a considerable degree of inter-relation is found between good scholarship and early graduation. This is best brought out by the fact that only 14 per cent of the men who graduated in the first tenth of their class were 24 and over but 28 per cent of the men who graduated

INTER-RELATIONS OF PAIRS OF FACTORS

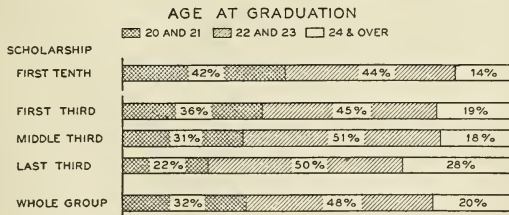
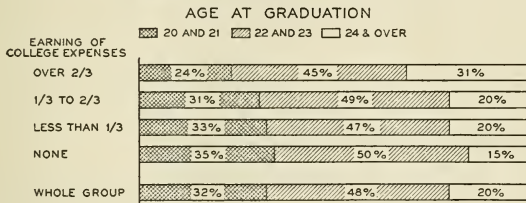
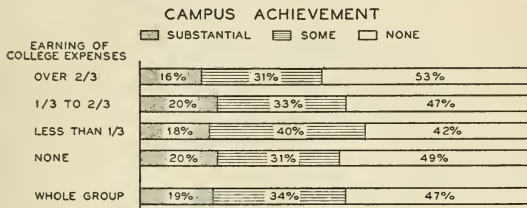


FIG. 4

in the last third of their class were 24 or over.

RELATIVE INFLUENCE OF SEVERAL FACTORS

Figure 5 demonstrates the analysis of this particular group in terms of the five factors studied. It shows the other method which has been used in this general study. The entire group of 1310 men was placed on a scatter diagram and lines dividing the group into three equal parts on the basis of salary were drawn. Scatter diagrams of each of the selected groups were then made and it was determined what proportion of each of them lay in the first salary third of the whole group, what proportion in the second third, and what proportion in the last third.

Thus, it is found that 53 per cent of the 185 men of this group who were in the first tenth in scholarship now are in the first third in salary, and only 18 per cent are in the last third in salary. Forty-five per cent of the men in the first third in scholarship were in the first third in salary and 27 per cent in the last third and finally for the last third in scholarship 22 per cent are in the first salary third and 45 per cent in the last third. It is important to discover just what chance there is that the distributions here found are due to errors of sampling. The chance of this, however, seems very small indeed. If scholarship were not a significant factor it would be most likely to find in any random sample about 33 per cent of the men in each salary third. If the 552 men who stood in the first third in their classes in scholarship constituted such a sample, there would be only one chance in about 100

million, that in the first salary third there would be found as much divergence from the expected 33 per cent as the 45 per cent which actually occurs represents. In the same way, in a sample of 247 men made up of those in the last scholarship third, there is only one chance in nine thousand that the divergence represented by the 22 per cent in the first salary third would occur.

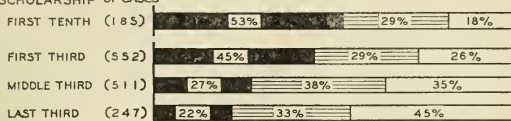
Comparing this group of bars for the men distributed according to scholarship with the next set where they are distributed by campus achievement, the former conclusion that scholarship is the more significant index seems to be rather well borne out, particularly since only 19 per cent of the group won substantial extra curricular achievement, but about 14 per cent of it were in the first tenth in scholarship and about 40 per cent were in the first third.

The earning of college expenses seems to be of very little significance. At first this seems distinctly surprising but on further reflection there appears to be cause for it. In the first place it is recognized that man earn their way through college not because they are able to but because they have to. Furthermore, although the men with higher earnings were not notably below their fellows in scholarship or in their participation in campus activities, it must be true that such men have sacrificed something in the opportunity for reading, for informal social contacts with their fellows and perhaps most important, the opportunity for reflection and for gaining a broad perspective on the work they are carrying on in college.

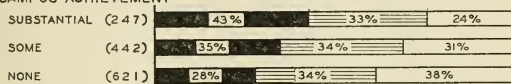
DISTRIBUTION OF COLLEGE GRADUATES BY SALARY GROUPS

■ FIRST THIRD IN SALARY ▨ SECOND THIRD □ LAST THIRD

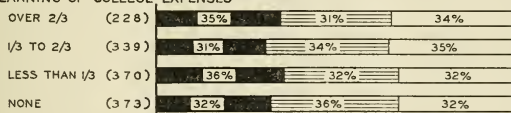
SCHOLARSHIP NUMBER
OF CASES



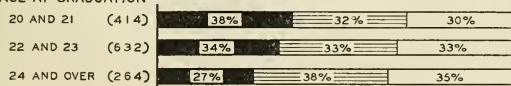
CAMPUS ACHIEVEMENT



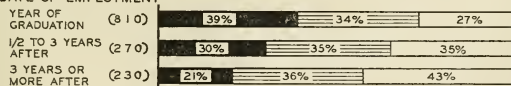
EARNING OF COLLEGE EXPENSES



AGE AT GRADUATION



DATE OF EMPLOYMENT



NOTE: BASED ON 1310 GRADUATES FOUR OR MORE YEARS OUT OF COLLEGE. SALARIES
WEIGHTED TO ELIMINATE PURELY GEOGRAPHICAL VARIATIONS

FIG. 5

On the other hand, the men who have earned their way have shown a degree of determination and capacity for hard work that it has not been necessary for their fellows to demonstrate. There is no question that these men in general are better off than if they had not gone to college.

Early age at graduation seems to be a small but significantly favorable factor. In fact, in a random sample of 414 men such as those graduating at 20 and 21 make up, there is only one chance out of 21 that as much divergence from the expected 33 per cent in the first salary third as the 38 per cent actually occurring represents and only one chance in 38 that among 264 men, namely those graduating at 24 and over, as much divergence would occur as the 27 per cent in the first salary third represents. The chance, therefore, that both divergences would occur together is about one in eight hundred.

It must be remembered that in this analysis the younger men are also somewhat the better men in scholarship but in combining the two factors more divergence from a normal distribution is obtained than with either factor separately. There seems, therefore, to be some value in early graduation regardless of scholarship but it is distinctly small.

The final set of bars in this chart brings out the value of entering into the Bell System very shortly after graduation. In fact, the first bar comprising about 60 per cent of the whole group is made up of those whose Bell System job was probably their first permanent job. On the other hand, the last bar includes men who spent three or more years in other work

before entering it. It shows a distribution that is only about as favorable as that for the men who graduated in the last third of their class in scholarship. There are, of course, individual cases where outside experience is of definite value in our work. On the whole, however, it seems to be true that a man who finds his field of work first and stays by it will do better in the long run. It should be emphasized, moreover, that this factor is distinctly independent of all the others.

THE INFLUENCE OF COMBINATIONS OF FACTORS

Figure 6 shows certain combinations of these factors. For example, the first set of bars covers only the men with substantial campus achievement and distributes them in terms of scholarship. From them, it is seen that the men who were both outstanding in campus activities and who were good students won somewhat greater success than those who were merely good students or merely outstanding in campus activities. The combination of the two factors, however, does not give strikingly more significant results.

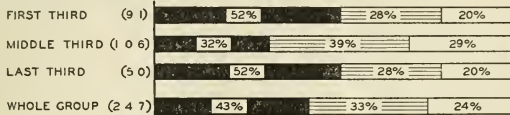
There is here, too, one definite variation from the favorable influence of scholarship. Of the men who won substantial campus achievement those who graduated in the last third of their classes are doing about as well as those who graduated in the first third. This is probably due in part to individual variations and might not be found with larger samples. It is true also that there were in this last third group a number of men with rather unusual campus achievement and that although that group includes a number

DISTRIBUTION OF COLLEGE GRADUATES INTO SALARY GROUPS

■ FIRST THIRD IN SALARY ▨ SECOND THIRD □ LAST THIRD

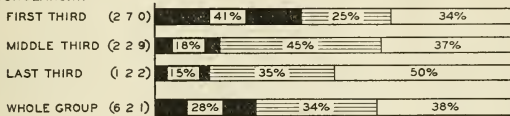
247 MEN WITH SUBSTANTIAL CAMPUS ACHIEVEMENT

SCHOLARSHIP
NUMBER
OF CASES



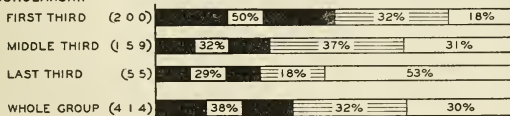
621 MEN WITH NO CAMPUS ACHIEVEMENT

SCHOLARSHIP



414 MEN GRADUATED AT 20 AND 21

SCHOLARSHIP



264 MEN GRADUATED AT 24 AND OVER

SCHOLARSHIP

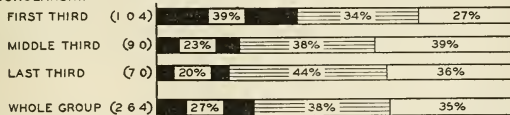


FIG. 6

of men whose salaries were sufficiently high to place them in the first third of the group studied, it does not contain as high a proportion of men of the very highest salaries and of those who are making the most permanent contributions to the policy and science of the System as does the group of first third men. Among men with no campus achievement, scholarship seems to be an exceedingly important factor.

The last two sets of bars combine scholarship and age of graduation. Since this combination gives more striking results than either factor along, it brings out the fact that each of them, regardless of their interrelations, seems to be important. These bars also show other rather interesting results. Of the men who graduated at the age of 20 and 21 but who were in the last third of their class, nearly a normal proportion are now in the first third in salary but the number of those in the middle third salary is small and that of those in the last third is distinctly large. Evidently the men who have the ability to graduate at 20 and 21 but who do a rather poor job scholastically, if they do not succeed reasonably well, are very likely not to succeed at all. This group may contain those with good ability but who are distinctly unstable. On the other hand, of the men who graduated at 24 and over in the last third of their class in scholarship, a very considerable proportion is now in the middle third of their group in salary.

The first set of bars in figure 7 distributes men in the first third of their class in scholarship by earning of college expenses. It indicates that where scholarship is kept constant the degree

of earning does seem to have some significance but not a striking one.

The next set of bars takes the 91 men who were both good students and won substantial campus achievement and considers them in terms of college earnings. The first bar of this set covers the most highly selected group in the whole study, those who were good students, were active on the campus and who earned over two-thirds of their way through college. It is not surprising that 11 of these men are now in the first third of their group in salary. It is somewhat surprising that 3 of them are in the middle third and that 2 of them are in the last third. Of course, the sample is too small for final appraisal of these results.

In these bars the degree of earning among highly selected men seems to be relatively unimportant and in the final set of bars it seems to have no importance at all. In fact the smallest proportion of successful men of any group is found in that group of men who earned over two-thirds of their way through college but who were in the last third in scholarship and who won no extra curricular achievement. Here again, the sample is rather small but it does appear that these men may well have sacrificed too much to go to college and that a high degree of earning is not compensation for failure to realize on the other advantages of college life.

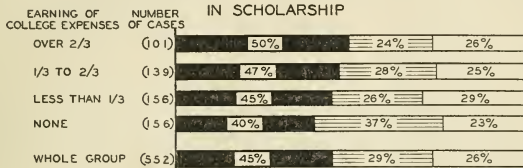
CONCLUSION

In conclusion there are two general observations which should be made. In the first place, it is recognized that there is no evidence of the effect of native ability in attaining success in

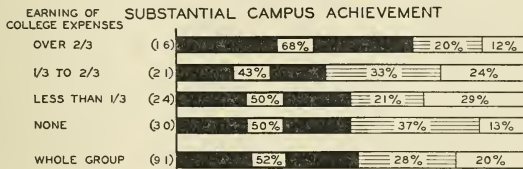
DISTRIBUTION OF COLLEGE GRADUATES BY SALARY GROUPS

■ FIRST THIRD IN SALARY ▨ SECOND THIRD □ LAST THIRD

552 MEN IN FIRST THIRD IN SCHOLARSHIP



91 MEN IN FIRST THIRD IN SCHOLARSHIP AND WITH



122 MEN IN LAST THIRD IN SCHOLARSHIP AND WITH NO CAMPUS ACHIEVEMENT

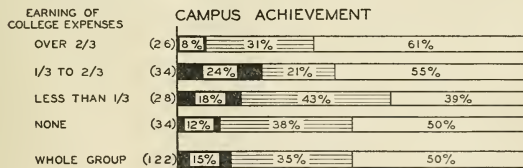


FIG. 7

the Bell System or in attaining college success. It has undoubtedly played a real part. It seems inevitable, however, that the effective work habits and the determination to do every undertaking well which helped some of these men to win success in college, have been equally important in their later achievement.

It is impossible, however, to answer this question effectively for this group. It is agreed that there is no test of native ability for mature men of varying ages. It may be possible, however, to throw some light on it in the future. We now plan to obtain information on the results of tests which were given to men employed by us when they entered college. In doing this we recognize that most of these tests are called scholastic aptitude tests. They are given primarily to throw light on the probability of scholastic success. Formerly such tests were called intelligence tests but that practice has usually been abandoned. It may very well be that their results will not in any sense correlate with business success. The experiment, however, is worth trying.

Finally, these charts seem to indicate that good scholarship, campus achievement, early graduation, in that order are significant indices of success in the Bell System. Earnings in college are not significant. On the other hand, it has been found that not all the members of the groups which were highly selected by combinations of these several factors do succeed. It is very evident that other elements are highly important. What all of these elements are, we have no way of knowing. They certainly include a man's

ability to adjust himself to the environment of his home and of his business as distinct from his ability to adjust himself to the environment of college. Another important element seems to be interest in and individual ability to do the work which a man has selected for his life work. Still another is the degree to which the organization with which he is connected can offer rewards which are in line with his most fundamental motives.

It is certainly true that the student who has done well in college, if he is to realize on the capacity and promise thus shown, cannot afford to neglect a careful analysis of himself and a thorough consideration of the businesses where his talents are most likely to be useful. He who has done badly in college has no occasion to believe that his pace has been permanently set. If he has discovered his own motives, his own interests and ability, if he has gained perspective on the things which may have hindered him in college, he may well choose a field of work in which he will surpass the men whose college achievement is more spectacular. In this regard, the industries who are employing college men carry a very grave responsibility. In employing these men they must adopt the broad point of view and must consider not only the degree of general promise which a man has but whether or not he is likely to succeed in that industry, whether or not they have his kind of work, and can offer him the type of reward which will maintain his enthusiasm.

Last of all it is very clear that the opportunity which college personnel and placement officers have is a very

great one. It is they who can help the student to solve problems which he may encounter in college; who can develop with him a method of meeting such problems when they occur in later life. It is they who should help him to discover what the requirements

and rewards of various businesses are and interpret these requirements and rewards to each student in the light of his own capacity and fundamental motives.

Manuscript received February 22, 1930

Progressive Developments in the Colleges¹

By CHAUNCEY S. BOUCHER, *University of Chicago*

This statesmanlike appraisal of the situation in the colleges, by the Dean of the College of Arts, Literature and Science of the University of Chicago, points directly toward the next necessary step in individualizing and vitalizing college education.

ONE who uses any form of the word "progress" runs the risk of being challenged with the bromidic wise-crack that "progress is a delusion." Colleges and college students are the particular butts of wise-cracks. This one is typical: "An American college is a great athletic association and social club in which provision is made, merely incidentally, for intellectual activity on the part of the physically and socially unfit." Here is another frequently heard, in the form of a conundrum: "Why is a college a great repository of learning?" Answer: "Because the freshmen bring in so much, and the seniors take out so little." Recently one of our better magazines published an article made up almost entirely of wise-cracks, entitled "Quack-Doctoring the Colleges," written, strangely enough, by a professor in a college which, with its

sound progressive innovations of the last decade, has done much to give meaning and significance to the Bachelor's degree. Wise-cracks are frequently amusing and stimulating; a good one twits on facts; but most of them are dangerous, if taken too seriously by the author or his readers, because they are only partially true and usually grossly exaggerate.

With keen appreciation I quote from another recent issue of one of our better magazines a definition which satisfies as can no smart-aleck wise-crack: "Education is the process by which one's mind is given discipline and discrimination, orientation in the modern world and understanding of it, and the adult ability to derive satisfaction from knowledge and from the pursuit of knowledge for its own sake." This definition of education in terms of basic and meaningful objectives, spells progress. What have we been doing recently to live up to such a definition?

Students, faculty members, and administrative officers of our better colleges are at present more constructively critical of the shortcomings and failures of the existing program and methods

¹ Reprinted by permission from The University of Chicago Magazine, February, 1930.

The word "Colleges" is meant to include those educational units organized on the four years basis, granting the Bachelor's degree, whether existing independently or as part of a university.

of undergraduate education than at any previous time in our history. The time and efforts of many persons are being devoted to a critical study of curricula, methods of instruction, and administrative and personnel problems of considerable variety through such agencies as national and local group conferences, commissions, committees, the questionnaire, and specially-appointed visiting agents. A day seems incomplete if it has not brought a questionnaire from another institution, and visitors on mission of inquiry and investigation are with us frequently. Change in performance merely for the sake of doing something different is foolish and dangerous—"quack-doctoring," indeed; but change based upon a careful study of the shortcomings of past performance in the light of tested thought and more clearly defined objectives is inspiring because charged with possibilities for progress. Though the limits of space do not permit adequate exposition and discussion, I shall list a few of the new developments successfully inaugurated in the last few years, and venture an opinion regarding the next needed departure.

EDUCATIONAL GUIDANCE

During the early history of our colleges, indeed down to a time within the memory of living men, there was no problem of educational guidance for students, because the curriculum was fixed. There was no choice between meat offerings or dessert offerings; each student was fed the same intellectual menu as every other student who entered at the same time. Came a time when research work

broadened the limits of old fields of knowledge and opened up entirely new fields. New courses could be introduced only if electives were introduced. In order that the curriculum should reflect the widened boundaries of knowledge electives were introduced, at first sparingly, and then wholesale. As is typical of us in so many phases of life, we went from one extreme to another—from the rigidly fixed curriculum to the almost completely elective curriculum. Twenty years ago, in many colleges, entering students faced a formidably large catalog with literally hundreds of course offerings, not clearly described and not properly related, with the elective system in vogue and with no faculty member and no administrative officer available to help them solve the Chinese puzzle of course elections. Throughout his four years a student with no definite professional aim, finding no one on the college staff to guide him, more often than not would drift from one subject to another, depending upon chance, caprice, or student gossip for his guidance, and would come out at the end of four years with an academic record sheet worthy of a place in an educational museum. And yet, a student with a constitution strong enough to withstand such a stuffing of utterly indigestible and unassimilable educational hash, would come out triumphantly with a diploma and a degree (though frequently without anything worthy of being called an education), provided only that he had accumulated a certain number of course credits. It is no wonder that in this period our college students developed for themselves as never before outlets for their

best thought and efforts, "Student Activities"—athletics, publications, dramatics, and a vast number of purely social activities—something interesting and more worthwhile than the meaningless and deadly academic mummery.

After seeing from experience the folly of both extremes—the rigidly fixed curriculum and the wide open elective system—the better colleges have endeavored to strike a happy medium by specifying degree requirements in general but meaningful terms, and by providing an educational guidance service. Regarding the former, the best practice now provides for a number of group requirements—English, foreign language, mathematics, natural and physical science, and social science—designed to furnish a proper balance in an introduction to general education to be completed by the end of the second year, and a sequence or concentration requirement for the last two years, so that a student may be sure to get deep enough into at least one branch of knowledge to master its technique and method of thought—so that he may think and express himself like an educated person in at least one field of thought. The educational guidance service—by a number of faculty members, whether called deans, advisers, or counselors—provides, when functioning properly, a sufficient number of faculty members, carefully selected because of appropriate qualifications, to give a reasonable amount of time to each student individually, to plan *with* each student, as well as *for* him, an educational program which seems to offer for him most possibilities for pleasure and profit in its pursuit.

These educational guidance agents, with students assigned to them on the basis of scholastic interests, play the rôles of guides, counselors, and friends, and are doing our most effective personnel work, of great variety, incidental to and as a natural part of their educational guidance work.

Recently we have heard much blare of trumpets about a fifth wheel to the college cart—an independent personnel department, whose staff members are not faculty members and are responsible only to the president's office. A college which has set up such an agency has done so apparently on the assumption that because faculty members have so long neglected their duty regarding educational guidance and all related personnel problems, they can not or will not study and meet this personnel service obligation of the institution to its students, even if the proper leadership were furnished. If this is so, then indeed there is no hope in us. However, I know from personal observation that, in a number of institutions, where the matter has been put before the faculty in an intelligent manner, it has not been difficult to recruit a sufficient number of faculty members in a very short time to afford adequate student service by men and women who derive great personal satisfaction from the service and soon acquire new points of view which make them all the more valuable as members of the staff of instruction. The faculty members not personally in this service soon come to look to those members in the service for opinions and recommendations of great value in faculty meetings when matters of academic legislation are considered. I have at-

tended national and local conferences of personnel workers of both types—faculty members and independent, full-time personnel workers. At the end of each conference I felt that I had never before been exposed to such an incongruous mixture of bunk and sound sense; and most of the bunk came from the non-faculty member workers. It is no wonder that these independent personnel departments, in most institutions where they exist, are looked upon with suspicion and distrust by the faculty members.

Freshman Week is another recent innovation attracting attention. I have examined the printed programs for this week at several institutions. It is quite natural that, in the early stages of this experiment, there should appear many features open to question on many scores. At present, the better colleges which support a Freshman Week have centered their programs around two objectives: educational guidance and orientation into college life generally. Our experience at the University of Chicago has led us to center very largely on the former, and to continue it and to develop the orientation project throughout the first term through individual conferences and general assemblies for Freshmen.

COURSE OFFERINGS

When old fields of knowledge were broadened and new fields explored by a most praise-worthy activity in research, which began to bloom and produce fruit in the closing decades of the last century, new courses began to appear in college catalogs, slowly at first as the fixed curriculum gradually gave way, and then very rapidly when

the elective system became general. Came a perfect flood of new courses of wondrous variety and description. The college catalog of many institutions in the early 1900's became a most formidable document in size and meaning. A critical examination of the courses announced in any one of two dozen departments in a single college would have shown that perhaps half of the courses in any department could not justify themselves on any ground, save one—they offered the instructors opportunities to pursue pet hobbies in a very limited part of a field—and that the course offerings of the department were not properly related and balanced.

This much-needed and too-long-delayed critical examination of departmental offerings has been brought into being in a steadily increasing number of colleges, particularly in the last ten years, by study of the problem of educational guidance and by the development of the Junior College movement.

In what may be termed the "chaotic" period, when the wide-open elective system ran riotously into utter confusion—a period which lasted in most institutions until ten or less than ten years ago, and still persists in some institutions—most departmental introductory courses were designed with the sole purpose of preparing students for advanced courses in the respective departments. It seemed that nearly every department framed its curriculum as though the intellectual sun rose and set within its boundaries, as though every worthy student must desire to specialize in that department, and as though that department had a life-long vested interest in every student who elected its introductory

course. Most departments seemed to think only in terms of specialization, and seemed to be interested not at all in students who wanted and needed an introduction to several departmental fields of thought as essential parts of a general education.

In the last decade a basic theory of college education has been put before us more and more frequently and with increasing forcefulness, that though a student who enters college with a well defined educational and perhaps vocational aim should be given the opportunity, and should be encouraged, to pursue that aim from the beginning of his freshman year, the major emphasis in the junior college years should be placed upon breadth of general education; and that, though general education should continue in senior college, the major emphasis of the last two years should be upon concentration in, and depth of penetration of, some particular field of thought. Thus the attention of each department has been called to its obligation to offer appropriate introductory work to no less than three types of students: first, students who expect to specialize in that department, or to center their senior college concentration in and around that department; second, students who know that they will not specialize in that department and yet desire its introductory work for the sake of rounding out a general education, or as an aid to work in a related field of thought; third, students who have not determined upon a field of concentration, but are looking for what may become for them a major educational interest.

Though one department may find it

possible, after careful study and planning, to design and offer a single course which will serve adequately and satisfactorily the needs of all three types of students, another department may find it advisable or even necessary to offer two introductory courses—one for the first type, and another for the second and third types of students. In the last few years one department after another, in our better colleges, has studied its course offerings as not before, in a generation, and has had the courage to scrap many of its old courses and introduce a new set, fewer in number and arranged in a well ordered, progressive sequence, with elementary courses designed not only to furnish the foundation material necessarily prerequisite for the departmental advanced courses, but also to serve the needs of students who are interested in a particular department only in so far as it contributes to a general education.

One of the first and most significant products of the study recently devoted to educational objectives and the curriculum, has been a new type of course, called an orientation or survey course. Though the first of these courses was in the field of the social sciences, similar courses have been developed in the natural sciences, the humanities, and the fine arts. In the main they are Freshman courses designed to orient the student in a large field of thought which, it is now recognized, frequently runs through and across many of the artificial boundary lines which have been established by the growth of the numerous departmental divisions which universities have developed and formalized. One example, no longer

in the experimental stage but a proven success, is a course which covers the whole field of the physical and natural sciences. For a student who may want no more than an introduction to the field of science, this course seems to be more profitable than any one of the old style departmental introductory courses; and for the student who expects to specialize in one of the sciences, this course gives him an excellent background for later concentration—it shows him the true position of his specialty in a larger field of thought, together with the contributing values of each specialized department for the others in the larger field of thought. The appearance of these general survey courses has caused more than one department to restudy the content of its introductory course with a view to making it satisfactory not only for the student preparing for advanced work in that department, but also for students who desire some knowledge of one departmental field as part of the preparation for work in a related field, and for students who desire some knowledge of this or that departmental field as part of a general education. At the present time it is clearly evident that our course offerings are rapidly becoming better organized individually and collectively than ever before.

INSTRUCTION

It is indeed refreshing to find our colleges giving increased attention to class-room instruction, not merely on the score of subject matter content, but also in regard to the personnel of the instructing staff and methods. In the later decades of the last century and the early years of the present

century, our faculty members developed research productivity to a remarkable degree. I would be the last person to belittle the importance of research. It is a well known fact, however, that in too many institutions research was made a fetish to the extent that good teaching was not only neglected but was actually scorned. Faculty members were appointed in too many instances for research ability only, with no inquiry made regarding teaching interest or ability and indeed, in some instances, in the face of positive knowledge that they were failures as teachers. Every university worthy of the name should be able to afford a few research appointments for some of our most remarkable researchers who have neither interest in nor talent for teaching; such men more often than not can work successfully with a few advanced graduate students, but these men and undergraduate students should not be made to suffer together. In recent years the tendency has grown for colleges and universities to insist that new staff appointees be not only creditable, if not brilliant, research producers but also satisfactory, if not actually inspiring teachers. There is no inherent incompatibility between effective teaching and research; indeed the latter should promote the former, if the faculty member has anything approaching a proper sense of value and proportions. Teaching interest and ability is actually being given more consideration in faculty appointments than at any time in the last half century.

And as for methods of instruction, it is no longer a disgrace and a cause for shame to confess an interest in the

study of, and experimentation with, new methods. The lecture method, "by which the contents of the professor's notes get into the note-book of the student without passing through the mind of either"—to quote another wise-crack—that relic of the period when printed books were scarce—is being questioned so that its abuses may be eliminated and its profitable uses stimulated. We are classifying our students for course units on the basis of appropriate levels of advancement. Illuminating experiments with the size of classes, sectioning on the basis of ability, promotion at any time in the term on the basis of demonstrated ability, special treatment for leading students, independent study periods (with classes suspended), various forms of the tutorial system, and scholastic aptitude and placement tests, are well under way with varying degrees of success and much promise for valuable effects upon future procedure.

One of the most noteworthy examples of special treatment for leading students has swept across the country in the form of honors courses. Though details of practice differ widely in various institutions, the basic feature of all honors plans provides for the better students in the last two years release from much of the formal and perfunctory class performance and gives much freedom and encouragement for self-education. Under the guidance of a tutor or departmental counselor each student pursues an individually approved program of work, depending upon the special interests and aptitudes of the student. The student is awarded the Bachelor's degree with honors provided he pursues his pro-

gram successfully and passes a final comprehensive examination in the field of the honors award—an examination which is of far more value as a demonstration of ability to think straight and to use factual information intelligently (real mastery of a large field of thought), than any number of examinations upon the completion of small units of work in isolated courses. This is excellent, as far as it goes, but it affects only the top stratum of our student body and puts significant meaning into college work for but a few of our students. I confess that my main interest in honors systems is found in the suggestions and examples they offer for modification of our procedure with the entire student body. This leads me to state my opinion regarding what this should lead to.

THE NEXT DEVELOPMENT

For some time a number of us, who have been studying present performance in college education throughout the country, have been questioning the most basic feature of degree requirements as now stated and administered—the course unit and course credit system. If we are to live up to the definition of education quoted in my second paragraph, we must free our students from the toils of the credit system, stated in terms of hours or courses, a certain mystic number of which is the *sine qua non* for a degree in all institutions, and in far too many is the sole requirement.

Our secondary schools have made remarkable progress in the last few years; indeed, though the graduates of these schools are entering colleges in far greater numbers than ever before,

they are better prepared than ever before. Our high-school graduates in many instances are now better educated than were many college graduates a few decades ago. Our college undergraduates are keener, more alert, more inquisitive, and more active intellectually than were the undergraduates of two decades ago. Though some of our state institutions, for political reasons, are unable to limit numbers or to require for entrance anything more than a certificate from an accredited high school, many colleges have limited their numbers and have invoked selective admission to insure higher quality. Institutions of the latter type have the best opportunities to individualize, to humanize, and to vitalize their educational processes; they should have in mind, as ends to be attained so far as may be practicable, (a) the substitution of fields of study for the present course units, (b) the provision of opportunity for the exceptional student to make more rapid progress, (c) the abolition of the present system of counting credits for a degree and the substitution therefore of comprehensive examinations and whatever other methods of demonstrating accomplishment may be expedient, and (d) in general, greater emphasis upon the student's opportunity for responsibility for his own education.

In the light of several new departures already successfully operating in a number of our most progressive colleges (discussion of which is not per-

mitted by the space limits of this article), and in view of the temper of thought among progressive leaders in many colleges, it seems that some institution in the near future will surely furnish the courageous leadership of example now so eagerly awaited in many quarters. Some college, already worthy of classification as progressive, has a remarkable opportunity to put all other colleges greatly in its debt, by adopting a program which will gather together the best of the recent but already successfully tested developments, and then take the final step which seems to require most courage—the substitution of the demonstration of ability, achievement and accomplishment for the book-keeping system of hours and course credits for the degree award. Because we are so much the slaves of custom in regard to administrative practices and machinery once adopted, this step seems a most radical departure. However, a careful study of the shortcomings of our past performance along with the remarkable results attained at Harvard with comprehensive final examinations, the tutorial system, and the independent study periods—to cite only one institution—would quite likely convince even one of conservative inclinations that the step suggested is sensible and logical at this stage of our educational experiment.

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Skill and Specialization*

A Study in the Metal Trades

Part I. The Nature and Measurement of Skill

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To analyze the skill of the workman in relation to the specialization of his work has required first a clarification of terms and an improvement of research techniques. The data here presented were secured in four metal manufacturing plants. Their interpretation has a vivid significance in a time like the present, when technical advance is complicating the problems of occupational adjustment.

This paper reports the methods and findings of a study made in four metal-manufacturing plants for the purpose of discovering the relationship between skill and specialization in workmen. A conception of the meaning of skill is arrived at first of all. The study included an analysis, by the Gilbreth motion-study technique, of the jobs of 75 workmen into terms of therbligs, and an evaluation of the skill shown in these jobs through their further analysis into skill-factors, by a method original with this study. By the use of the skill-factors, the Gilbreth simo-chart is expanded into a simo-skill-chart through which the therblig-skill-averages of the workmen are computed. From the therblig-skill-averages, indexes of the skill of each workman (1) in relation to the skill of other workmen on the same machine (2) to that of all workmen studied in his plant, and (3) to that of all workmen studied in the four plants, are arrived at by formulae based on simple principles.

Part II of the paper takes up the case studies made of each workman in which ratings were given (by methods familiar to all who have made

* This study was undertaken at Bryn Mawr College during the year 1927-1928, under the direction of Professor Susan M. Kingsbury, director of the Carola Woerishoffer Graduate Department of Social Economy and Social research, and of Dr. Lillian M. Gilbreth, of Gilbreth Incorporated, consulting engineers and originators of Gilbreth motion study and job analysis. The writer developed the plan of study and of analysis, directed the field and laboratory work, developed the formulae, made the calculations and interpreted the results.

In order to obtain a field of research broad enough to yield significant result, six graduate students, members of a seminary in social and industrial research conducted by Professor Kingsbury, served as field investigators. Miss Annie Shaw, one of the students, assisted in the development of methodology needed and has started a study of her own on skill and satisfaction which will continue the research. Other members of the seminary were Bertha Blair, Thelma Coe, Abba Fernald, Margaret Inabnit and Lillian Shapiro.

case studies in industry) on psychological attitudes as well as on the more definitely measurable factors of production standing, trade training and previous education, wages, hours, conditions of work, etc. The study dovetails the statistical and case-study methods.

The findings of the paper are arrived at largely through comparisons and correlations of the skill indexes with the ratings arrived at through case study. The findings indicate that where skill exists and is given play to a considerable degree, it tends to become the first and greatest source of satisfaction to the workman; and that specialization of work may certainly be associated with lesser skill in workmen. A determinable reduction of skill required occurs in accordance with the degree of specialization of work. If this is true, the skill, actual and potential, of workmen is one of industry's vast and unexploited resources. The findings indicate, too, to the author of the paper, that the skill-index for skill evaluation, based upon the simo-skill-chart and derived from the therblig-skill-average of the workman, is both practicable and trustworthy, even though crude. The study indicates a need for further study of skill, and particularly for a technique whereby the degree of skill used by a workman in a certain process may be measured.

JUST what is the relationship between the skill of a workman and the degree of specialization of his work? It has been assumed in some quarters that automatic machinery, with the consequent high degree of specialization of work, has brought into existence a human automaton to tend the machine, devoid of skill, and of pride or satisfaction in his work. By others it has been assumed that the greater the accuracy of the machine-made product, the greater the accuracy

of workmanship demanded, and hence the greater the skill of the worker. It was in an attempt to arrive at some specific answer to the question of the relationship between skill and specialization in modern industrial life that the study, whose methods and findings are recorded in this paper, was undertaken. But before describing the technique used in approaching this problem, it is necessary to discuss the nature of skill and arrive at some agreement as to the use of terms.

1. THE NATURE OF SKILL

DEFINITIONS OF SKILL

If any man shows himself extraordinarily able to perform some function not easily performed without practice, whether in the field of craft, art, sport, or other branch of directed human activity, it is usual to refer to him as a person skilled in his particular field of action, and to call the ability which

he displays in his performance, skill. According to the *New English Dictionary*, skill is "discrimination or discretion in relation to special circumstances"; or again it is "capacity of accomplishing something with precision and certainty." According to the *Oxford Dictionary* it is "expertness, practical ability, facility in doing something."

While the word, for the most part, is loosely used to mean a number of things, certain attempts have been made to define, more specifically than the dictionaries have done, the precise nature and meaning of skill, with its psychological and physiological connotations.

From the psychological point of view, Pear¹ has, more than any other, considered the subject. His definition and analysis are significant. "Skill," he writes, "is the integration of well-adjusted performances." It includes a group of well-formed habits. The skilled sportsman or craftsman for instance, has a whole set of well-directed responses rising spontaneously to meet certain stimuli—as, the tennis player grips his racquet, and the woodworker his hammer, with an habitual grip. But the outstanding feature of habit, Pear points out, is its specificity. Habit is "acquired specific response to a specific situation," while skill includes the ability to meet a varying situation with the proper response to obtain a desired end. Skill, therefore, "implies discrimination of the situation and graduation of the response." Its essential characteristic is "the ability to integrate responses and, in the highest skills, to substitute instantaneously if necessary one type of integrated response for another." Skill, as distinct from

habit, involves "the ability to be aware of and to correct faulty adjustment. A surgeon's or automobile driver's skill implies this. While it consists partly of habits, skill permits immediate interference with any single habit or combination of them."

For the purposes of this study we have accepted Pear's conception, that *skill is the integration of well-adjusted performances, adapted under varying situations to the attainment of a desired result*. While it consists primarily of habits, it is more than merely a "congeries" of habits. The habits, at least, must be of the kind to ensure adaptation.

The same points are emphasized by Miles.² Writing of the acquisition of muscular skill in industry, he states: "The essential feature of skill is the ability to modify as required a series of movements that are in the main habitual."

The industrialist, in contrast to the psychologist, usually does not define skill at all. He uses the word freely, but in most industries, as Bezanson³ has pointed out, there is little preciseness of definition as to what constitutes skill or its lack. The result is a looseness of use and meaning. The precision expert, who standardizes with the utmost care the terms he uses to describe the essential elements of machine and materials, refers with equal vagueness of meaning to skilled, semi-

¹ T. H. Pear. *The Nature of Skill*. *Journal of National Institute of Industrial Psychology*, October 1923, vol. 4, no. 4, pp. 193-194. See also: Skill. *JOURNAL OF PERSONNEL RESEARCH*, April 1927, vol. 5, no. 12, pp. 478-489; *Skill in Work and Play*. London: Methuen, 1924, pp. 37-45; and *Fitness for Work*. London: University of London Press, 1928, pp. 16-35.

² G. H. Miles. *The Acquisition of Muscular Skill in Industry*. *Journal of the National Institute of Industrial Psychology*, 1926-27, vol. 3, pp. 45-50.

³ Anne Bezanson. *Skill in Industry*. *Quarterly Journal of Economics*, 1921-22, vol. 36, pp. 626-645.

skilled and unskilled workmen, and to skilled, semi-skilled and unskilled work. The consequence, as Pear⁴ has noted, is a certain amount of acrimony in debate which often might have been avoided by a proper recognition of the precise nature and content of the matter discussed.

The industrialist, indeed, has done more than use the word vaguely. He has used it confusingly. In his discussions of the increasing mechanization of work, when he refers to the embodiment in the machine of powers and capabilities which previously belonged only to the skilled workman, he has called the process "the transfer of skill" from workman to machine.⁵ By that use of the word he has made skill mean only the practical power of accomplishing a specific result; and in so doing he has confused the means with the end. He has made skill a characteristic of a machine as well as an attribute of the workman.

This looseness of definition is contrary to the spirit of science; such a broad interpretation of a word renders it incapable of being used and understood with precision. Just as engineers and scientists have reduced their tolerances in work to a fine scale, so psychologists and sociologists must

clarify popular concepts and insist upon a precise use of their terminology if they are to obtain anything like precise results from their analyses.

THE INADEQUACY OF THE STUDY OF SKILL

The vagueness of the precise meaning of the word skill at the present time, however, is not to be wondered at if one realizes to what a comparatively small degree skill has been the subject of study and analysis.⁶ The attainment of skill has, of course, long been a fundamental requirement for man's development along many lines. But to cultivate a quality and to recognize the essence of that quality are two different things.

In industry, for example, much attention has been given in recent years to methods of work. The discussion of "the one best way"⁷ and the development of motion study on both sides of the Atlantic Ocean is an effort to catch and to standardize, within reasonable limits and with due regard to individual differences, the skill which goes into a superior performance. But a consideration of the vital mental or muscular qualities which constitute that skill has not been attempted by engineers and has been only touched upon by industrial psychologists who have used the motion-study techniques.

Some effort has been made to measure proficiency of work by output.⁸

⁶ See Bibliography, p. 69. The bibliography includes references to books and articles which throw light upon the subject even though they do not analyze it.

⁷ Frank B. Gilbreth. *Motion Study*. New York: D. Van Nostrand, 1911.

⁸ P. M. Elton. *Analysis of Individual Differences in the Output of Silk Weavers*;

⁴ T. H. Pear. Skill. *JOURNAL OF PERSONNEL RESEARCH*, April 1927, vol. 5, no. 12, p. 482.

⁵ See L. P. Alford. *Laws of Management Applied to Manufacturing*. New York: Ronald Press, 1928, p. 32. Also Dexter Kimball. *Principles of Industrial Organization*. New York: McGraw-Hill, 1925. Also, The Present State of the Art of Industrial Management. *Transactions of The American Society of Mechanical Engineers*, 1912, vol. 34, pp. 1131-1229.

But output is not an adequate measure of skill in any strict sense, nor has it been assumed to be so. The steadiness of the worker at his work, his habits centering about his work (such as the arrangement of his tools and materials), his attitude toward his work, depending in part upon his temperament and his response to his situation—all these conceivably may affect the quantity of his output. Even where the measurement is taken over a limited period and under controlled conditions, it must necessarily still be only of quantity of the worker's product, or, at best, of the speed with which he works, and not at all of the specific skill which he uses.

Closer to the problem have been the efforts of certain psychologists to analyze the essence of learning in muscular performance.⁹ Curves of learning have been established with their accelerations and plateaus which have almost become norms in the study of the learning process. But analysis of the skill finally attained in the developed performance is still insufficient.

Aptitude testing is, in a measure, related to the analysis of skill. The

effort, through tests, to discover and to grade motor capacities has received much attention from students of vocational selection and guidance. But their research has centered in the study of native capacities for muscular and mechanical performance.¹⁰ And native capacity is not skill. Skill, by the definition of this study, is the result of trained or practised ability.

Objective tests for so-called skilled performance have also been attempted and with a measure of success. But again, to note the existence of a performance exhibiting skill in the performer and to analyse the content of the skill exhibited are quite different things, and though some effort is being made at present to do the latter, no published results are currently available.¹¹

A valuable series of studies on the transferability of skill is in process under the direction of T. H. Pear.¹² These are vital to any discussion of the problem and will be considered in

and H. C. Weston. *A Study of Efficiency in Fine Linen Weaving*. Industrial Fatigue Research Board Reports, Nos. 17 and 20. London, 1922.

⁹ See, for example, W. F. Book. *The Psychology of Skill*. New York: Gregg, 1925, chapter II; James H. Leuba. Learning to Make Hand Movements. *Psychological Review*, 1905, vol. 12, p. 351; W. L. Bryan and N. Harter. Studies on the Telegraphic Language. *Psychological Review*, 1899, vol. 6, p. 356; J. C. Chapman. The Learning Curve in Typewriting. *Journal of Applied Psychology*, 1924, vol. 3, pp. 252-268.

¹⁰ See, for example, B. Muscio. Motor Capacity with Special Reference to Vocational Guidance. *British Journal of Psychology*, 1922-23, vol. 13, pp. 157-184; J. L. Stenquist. *Measurements of Mechanical Ability*. New York, Teachers' College, Columbia University, 1923; F. L. Keane and J. O'Connor. A Measure of Mechanical Aptitude. *PERSONNEL JOURNAL*, 1927, vol. 6, no. 1, pp. 15-24; and L. D. Anderson. The Minnesota Mechanical Ability Tests. *PERSONNEL JOURNAL*, 1927, vol. 6, pp. 473-478.

¹¹ The National Institute of Industrial Psychology of Great Britain is working along this line.

¹² Compare J. N. Langdon and Edna M. Yates. An Experimental Investigation into Transfer of Training in Skilled Performance. *British Journal of Psychology*, 1928, vol. 18, no. 4, pp. 422-438.

more detail later. Despite this excellent beginning, however, the study of skill is in its infancy.

MASS PRODUCTION AND SKILL

Mass production, contrary to popular opinion, is not a new characteristic in American industry. A recent book on industrial methods¹³ states that it started with one Simeon North, a manufacturer of pistols from 1799 to 1852. But however early its start, the real development of mass production, with its attendant train of industrial changes, bringing the necessity for specialization on the part of the worker, has taken place within the last twenty-five years.

The influence of automatic machinery, on the skill of the workman has been under immediate discussion for something over fifteen years.¹⁴ The debate has been, sometimes, very earnest. On the one side range some of the keenest critics of present-day industrial development.¹⁵ They point to its complex organization, its subordination of product to profit, its consequent feeding of large amounts of standardized product to constantly stimulated markets, its specialized division of labor and semi-automatic

machinery—in short, to the primary characteristics ascribed to mass production—and they show how work has often been reduced to a routine performance of simple and easily learned actions constantly repeated. They picture the mass of the workers, who lost the ownership of their tools a century ago, as having now lost possession of their skill, the last and most vital part of their "laborers' capital." The man operating the machine has become a "cog in the wheel," they say, without chance for initiative, self-expression, or even trained ability which is not easily displaceable at any moment.

On the other side range the equally intelligent observers (and in some instances they are closer to the problem), who point to the amazing intricacy and relative perfection of certain modern industrial products, to the consequent high degree of accuracy in workmanship obtaining, and to the special dexterity in one form or another necessary to the workman producing them. To belittle the skill of certain of these modern workmen, they claim, is comparable to an assumption that the modern specialist in surgery or medicine is less skilled than his predecessor, the general medical practitioner, because he concerns himself with a lesser portion of the human body.

Obviously both these arguments contain something of truth. The fault lies in an assumption that either describes the entire situation. Modern industry is a broad field of action with complex and even contradictory developments within it. Observations and criticisms applying to certain por-

¹³ L. P. Alford. Previous citation, p. 53.

¹⁴ The first of the papers considering the transfer of skill published by The American Society of Mechanical Engineers, No. 1378, was published in 1912.

¹⁵ For one of the best of these criticisms see Thorstein Veblen. *The Instinct of Workmanship and the State of the Industrial Arts*. New York: Viking Press, 1914; also Helen Marot. *The Creative Impulse in Industry*. New York: Dutton, 1918; and R. M. Fox. *The Triumphant Machine*. London: Hogarth Press, 1928.

tions of automobile manufacture, which may be characterized by mass-production methods, may not at all, at present, fit the manufacture of electric-power machinery, where a similar degree of standardization and specialization is not possible. Nor can it be assumed that the two will ever be alike.

To determine the place of skill and the amount of it required under the various methods of production, and to analyze it into its constituent elements will be a difficult task. For skill has not yet been measured. No unit of measure for it has yet been conceived. But the student of industry faces the necessity of attacking the problem of its analysis and measurement. Skill is a vital factor in the effect of mass-production upon the workman producer, and in that effect lies the challenge to the student of industrial conditions.

A BEGINNING OF SKILL ANALYSIS

To attempt an analysis of skill is to set sail on an almost uncharted sea. Mr. Pear, whose definition has already been given, has suggested a classification which is helpful.¹⁶ He has listed five grades of industrial skill:

1. *Collections of imperfectly adapted responses, imperfectly adapted, that is, to the situation which evolves them;*
2. *Perfectly adapted responses which do not exhibit personality;*
3. *Responses resembling habits but less specific and automatic, that is, capable of rapid adjustment to a new situation such as would seem to be*

neither mechanical to the observer nor unconscious to the performer;

4. *Responses like those in 3, but exhibiting in their totality a pattern characteristic of the individual;*
5. *Creative skill, both (a) unconscious and (b) resulting from a deliberate analysis of earlier attempts which would be satisfactory to most persons but are unsatisfactory to the creative genius.*

Most types of industrial skill today would seem to come under the second, third and fourth of these grades. The first suggests a state of skill unsatisfactory to the situation except in the case of the learner. If it were an extended state, it would hardly fulfill the requirements necessary for any modern industrial situation, however simple the work done. The last grade, though often assumed (whether or not correctly) to be the primary element in earlier forms of craftsmanship, probably has a comparatively small place, among manual workers at least, under present industrial organization.

A more recent publication of Pear's¹⁷ suggests that the term skill should not be applied to the first two of his classifications. To the omission of the first, this writer certainly would agree. And the second refers to a type of trained ability which might possibly be termed proficiency or even dexterity rather than skill. The line of distinction between proficiency or dexterity and skill can never be a clean-cut one, however. And the higher grades of the former must certainly shade into

¹⁶ T. H. Pear. *The Nature of Skill*. Previous citation. Also, *Skill*. Previous citation, pp. 488 and 489.

¹⁷ T. H. Pear. *Rationalization and Its Influence on Industrial Relations*. The Nature and Present Position of Skill in Industry. *The Highway*, February 1929, vol. 21, p. 70.

the lower grades of the latter. The inclusion of the second of the five classifications, therefore, *the perfectly adapted responses which do not exhibit personality*, might well, for the present, be tentative.

But these classifications, suggestive as they are, still are too general for detailed or specific evaluation. In the interest of both speech and thought upon the subject, an effort at such evaluation is needed.

2. A TECHNIQUE FOR EVALUATING SKILL

THE PURPOSE AND METHOD OF THIS STUDY

The purpose of this study originally was to discover, in specific terms, the relation between skill and specialization in industry. But since no tool was at hand with which to evaluate skill, it was necessary to forge one for the purpose as the project advanced. Of necessity, therefore, the purpose of the study became primarily an attempt to evaluate specific instances of industrial skill, and secondarily an investigation into the relation between skill and the degree of specialization under which it was found. Part II of this study, which will appear in the next issue of the *PERSONNEL JOURNAL*, will discuss the secondary purpose of the study under the title, "The Significance of Skill."

In an attempt to evaluate skill, at least two alternatives are possible theoretically. The first is to discover a unit and to measure the unknown quantity in terms of that unit. The second is to attempt an analysis of the component parts of the unknown (skill, in this instance), and to discover from specific examples of it a relative grading in terms of the component parts. This latter is the method used in the development of intelligence tests, where, without defining intelligence in precise terms, an attempt at

evaluation is made by a grading based on various performances indicating it. The evaluation is expressed in terms of a relation to discovered norms based on a large number of cases.¹⁸ While it would not be appropriate to discuss here the successes and failures of intelligence tests, it is permissible to point to them to show the possibility of a profitable and suggestive if not infallible evaluation on such a basis, even when a precise definition of what is being evaluated repeatedly fails of acceptance.

This study has attempted to evaluate skill, therefore, on the principle that a method for measurement may prove to be useful even when it precedes a precise definition of the matter measured. The method used, however, was not comparable to methods of intelligence testing. As previously suggested, the many tests to discover and to grade motor capacity are comparable to intelligence testing. This

¹⁸ C. Spearman. *The Nature of Intelligence and the Principles of Cognition*. London: Macmillan, 1923; also G. H. Thompson. *The Nature of General Intelligence and Ability*. *British Journal of Psychology*, 1924, vol. 14, pp. 229-235; also E. L. Thorndike, E. O. Bregman, M. V. Cobb, E. Woodyard and others. *The Measurement of Intelligence*. New York: Teachers College, Columbia University, 1926.

study made no attempt to discover or to grade either general or specific inherent capacities. It attempted (1) to isolate certain instances of actual performance and to analyse them in specific terms, and (2) to investigate the relation between skill and the degree of specialization under which it was found. The term skill is used, in this study, to refer to a quality of the workmen, never to a quality of a machine or to a characteristic of the work done. It is considered a personal and a human quality. The skill discussed is the skill of workmen shown on a particular piece of work. In industrial terms, it is *skill on the job*. The skill observed is that based on Pear's definition as outlined at the beginning of this chapter, i.e., *the integration of well-adjusted performances adapted under varying situations to the attainment of a desired result*. As applied directly to an industrial process, the definition was interpreted to mean the adaptation of a man's capacities and abilities, such as are suitable, to the *job* he performs. It included the habits which he had built into that performance; it included also the ability to vary the habits in accordance with a specific need for the accomplishment of a specific result—that is, the satisfactory making of a product, or of whatever portion of it was allotted to him. The so-called “unskilled job” was one requiring little or no adaptation. (It is difficult to imagine any industrial job not requiring some integration of adjusted response from its performer.) The so-called “skilled job” was one which required a high degree of adaptation.

Though the definition of skill on the

job is still necessarily couched in general terms, the method of this study was specific. The definition can therefore serve only as an introduction to the problem and as a touchstone for further development. Conceivably a rather large amount of change in the definition or disagreement as to its meaning might occur without vitiating the practical value of the analysis of *skill on the job* here attempted.

TYPES OF PLANTS SELECTED FOR STUDY

The study was one of types. It sampled, in the metal trades, an industry which contains widely different developments in organization and types of product, yet which uses many similar processes. The plants selected were as representative of the industry as possible, but offered opportunity for comparisons. They produced goods and utilized processes that allowed degrees of standardization of product, mechanization of process and specialization of work varying from plant to plant. The plants studied (Hess Bright Manufacturing Company, Leeds Northrup Company, Stokes and Smith Company, and Westinghouse Electric and Manufacturing Company) were of the better type of metal-manufacturing concerns in Philadelphia, judged by a study of quality of product, conditions of work and industrial relations, and were prominent members of the Metal Manufacturers' Association. They belonged to three of the five of Bezanson's classification of machine-shop and pressed-metal-work establishments,¹⁹ namely: (1)

¹⁹ Anne Bezanson. Labor Market Comparisons: Turnover Rates in Four Metal-Manufacturing Centers. JOURNAL OF PER-

the machine shop with foundry, making heavy machinery, hydraulic and textile machinery, condensers and the like; (2) the light machine shop without foundry, making light textile and paper-box machinery, electrical devices, etc.; and (3) establishments making light pressed-metal and electrical instruments.

It seemed advisable to select plants whose working conditions, both physical and social, were such as would reduce to a minimum the variables attendant upon field research. Thus, the four firms chosen were all housed in modern, well-built and well-equipped factory buildings. All were located in thriving but not crowded manufacturing districts, with space surrounding the buildings for lawn, playing fields and parking. All were kept in good condition inside and out, and each had an attractive appearance. The managements of all were, in general terms, liberal and forward looking, businesslike in their attitude toward shop employees, but sympathetic with matters of concern to them. Industrial relations gave every evidence of being harmonious and reasonably satisfactory to all parties.

The work selected was performed in the light machine shop in each plant. Particular effort was made to choose machines of comparable type from shop to shop, requiring comparable degrees of skill from the workmen, and at the same time to obtain a representative sample of the machines used in each shop. The differences which occurred were mostly those arising from varia-

tion of product, especially those arising from standardization and consequent specialization, and from variation in size of part made.

The workmen chosen represented a good average in skill and output, based on the judgment of the management. Usually they were the successful workmen; occasionally they were below the average; more often they were above it. They were not, however, solely the best workmen.²⁰ Where a variety occurred in the work they did, an effort was made to choose a typical job for observation and analysis, and, where a satisfactory type was not obtainable, to select more than one job. Both set-up and operation of machine were used.

A total of 75 workmen were finally included in this report, working upon 11 types of machines, in 4 plants. The machines selected include the punch press, drill press, grinder, planer, milling machine, engraving machine, grooving machine, horizontal boring mill, hand-screw machine, and engine and turret lathes. The processes selected consisted of cutting, turning, boring, grinding, and similar operations. From one plant some assembly work was also studied, but in analysis it was never used in comparison with the selected work of the other plants.

MOTION STUDY THE BASIS OF THE TECHNIQUE

The method of study included, in the first place, a careful job analysis through an adaptation of the Gilbreth

SONEL RESEARCH, 1927, vol. 5, no. 10, pp. 387-404.

²⁰ Tables in an Appendix to this article, which will appear in the next issue of the PERSONNEL JOURNAL, will give detail.

PROCESS CHART

Machine: Horizontal Boring Mill

Part: Cylinder Cover

Operation: Finish Bore and Chamfer



FIG. 1

technique of motion study. Gilbreth motion study is familiar to industrial

engineers and industrial psychologists. It is fully described in *Applied Motion*

Study,²¹ so only a brief statement of it is made here. It begins with recording into what is called a process chart, accurately and in order of sequence, every significant movement made by the person studied (See fig. 1). Where the movements are too rapid for the eye to follow, or where a high degree of accuracy in the time consumed for

bligs," that is, their analysis of a workman's motions entering into any industrial process. The therbligs as the Gilbreths have used them are shown in the accompanying tabulation.

Each therblig has a symbol to facilitate its use and a color or standardized cross hatching to aid its charting. The therbligs are entered upon a chart

Search.....	○
Find.....	⊙
Select.....	→
Grasp.....	∪
Position.....	6
Transport loaded.....	6
Assemble.....	#
Use.....	U
Dissemble or take apart.....	+
Inspect.....	o
Prepare for next operation or preposition.....	3
Release load.....	⌒
Transport empty.....	∪
Wait (an unavoidable delay).....	∪
Wait (avoidable delay).....	∪
Rest (for overcoming fatigue).....	⌒
Plan.....	⌒

each motion is desirable, the micro-motion film secures a moving picture of the operation. A micro-motion clock records the times in $\frac{1}{2000}$ of a minute, or a "wink," as the picture is taken. The movements are then analysed into what the Gilbreths have called "ther-

which records the elements of motion and their times vertically, and the various working members of the body horizontally.²² This chart is called the simultaneous motion-cycle chart, or simo-chart. (See fig. 2, first three columns.) It gives a complete visualization, therefore, of the various

²¹ Frank B. and Lillian M. Gilbreth. *Applied Motion Study*. New York: Macmillan, 1917.

²² Frank B. and Lillian M. Gilbreth. Previous citation, chapter 3.

SIMULTANEOUS MOTION-CYCLE AND SKILL CHART

Machine: Horizontal Boring Mill

Part: Cylinder Cover

Operation: Finish Bore and Chamfer

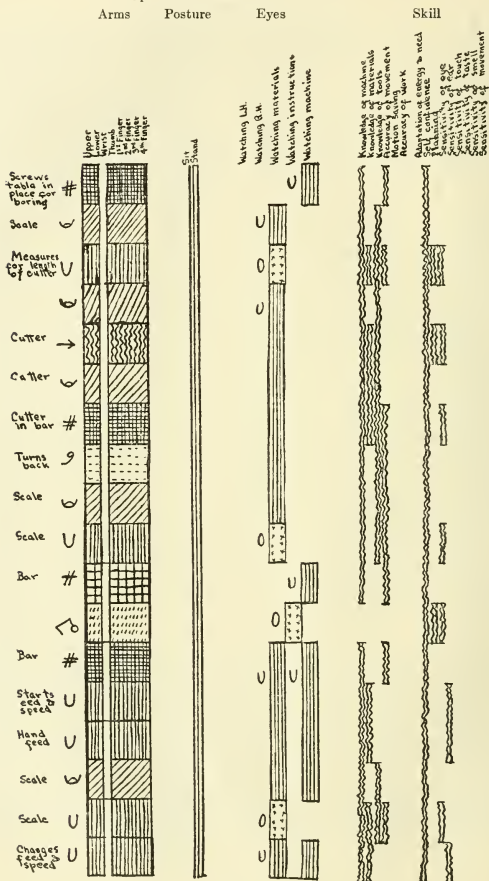


FIG. 2

members of the body engaged in performing the operation, the elements of motion used by these various members, and the relative and actual time consumed by each element of motion.²³ Figure 2 shows under "arms," "posture," and "eyes" the method of the simo-chart as the Gilbreths have used it.

The motion-study technique, adapted to the requirements of this study, yielded an analysis of the job in terms of therbligs. Process charts were made by the investigators of all the selected jobs. These in turn were analysed into simo-charts, the unit of measure being a therblig of uniform and arbitrary length. The time element, except in a few special cases, was omitted, lest the timing be confused, by the men observed, with the time study used in all of the plants for wage-rate setting. Motion pictures were taken in all of the plants, however, for experimental purposes. They will be discussed in Part II of this article, in the next issue of the *PERSONNEL JOURNAL*.

AN ANALYSIS OF SKILL INTO SKILL-FACTORS AND THE SIMO-SKILL-CHART

The analysis of skill and its charting are possibly a logical development of the Gilbreth technique. They are, however, original with this study. The analysis of skill into definite and observable elements of skill-factors was an attempt to put into concrete

and usable form a phenomenon which had heretofore been considered too intangible for specific treatment. The analysis developed, expressed as nearly as possible in terms of industrial usage, was based in part upon the outlines of certain apprenticeship courses available for the study,²⁴ in part upon a classification of skill worked out by one of the plants studied,²⁵ in part upon the statements of various shop superintendents as to machine-shop practice, and in part upon the observation of the investigator assisted by engineers in the Gilbreth laboratory.

The result amounts to a carefully prepared method of skill notation whereby the various aspects of a workman's skill may be observed and isolated. No satisfactory method for measuring the amount of any skill-factor observed was developed so that the existence of a skill-factor in an unmeasured degree only was noted.

The charting of the skill observed through the notation of the skill-factors was developed into the simultaneous motion-cycle and skill chart, or the simo-skill-chart, as it might be called. It consisted of the Gilbreth simo-chart, supplemented by a skill notation, whereby each skill factor observable in a workman performing a selected job was charted along side of the motion or therblig to which it belonged, thus relating the skill factors observable to the elements of the industrial operation during which they ap-















²⁴ Apprenticeship Courses of the Metal Manufacturers' Association of Philadelphia and of Westinghouse Electric and Manufacturing Company.

²⁵ Westinghouse Electric and Manufacturing Company, South Philadelphia, Pa.

²³ Frank B. Gilbreth. Motion Study for the Crippled Soldier. *Journal of the American Society of Mechanical Engineers*, 1915, vol. 37, p. 669.

peared.²⁶ The skill-factors were arranged horizontally. Their relation to the therbligs, and, in the few cases where film charts were available, to their times of use, were arranged vertically.²⁷

The analysis of skill into its skill-factors and the symbols representing each are as follows:²⁸

Adaptation to machine.....	
Adaptation to materials.....	
Adaptation to tools.....	
Accuracy of movement.....	
Motion saving.....	
Adaptation of energy to need.....	
Self confidence.....	
Plan.....	
Sensitivity of eye.....	
Sensitivity of ear.....	
Sensitivity of touch.....	
Sensitivity of taste.....	
Sensitivity of smell.....	
Kinaesthetic sensitivity.....	

²⁶ The plan for charting the skill and the symbols used were devised by Annie Shaw.

²⁷ An effort was made to chart in parallel columns the skill developed by training, that developed by experience through following directions, and that developed by the workman's own initiative, but it proved unsuccessful. A better distinction would be one more closely in line with Pear's classification into grades of skill given a few pages back.

²⁸ Compare characteristics of skill included among the skill-factors with Pear's division of skill into "propria" and "accident" factors in the concluding pages of this study in the next issue of the PERSONNEL JOURNAL.

Adaptation to machine refers to the workman's neuro-muscular reactions arising from his use of his machine, his habits and knowledge which enable him to regulate, operate and utilize it in accordance with its capacities.

Adaptation to materials refers to his knowledge of the materials with which he works as built up by his handling of them, and his consequent appreciation of their idiosyncracies and requirements; that is,

of the speeds and feeds which are suited to their manipulation.

Adaptation to tools refers to his power of discrimination in the use of specific tools to accomplish specific ends, their choice, placement, use and upkeep.

Accuracy of movement represents his ability to direct a movement without error and with control,—a performance adapted to a given need.

Motion saving signifies his ability to place materials and tools in ways which shall facilitate their handling.

Adaptation of energy to need refers to his use of energy nicely suited to requirement, without waste, or beyond a minimum exertion which is adequate to the purpose.

SIMULTANEOUS MOTION-CYCLE AND SKILL CHART

Machine: Blanchard Automatic

Part: Outer Race Ball Bearing

Operation: Surface Grinding

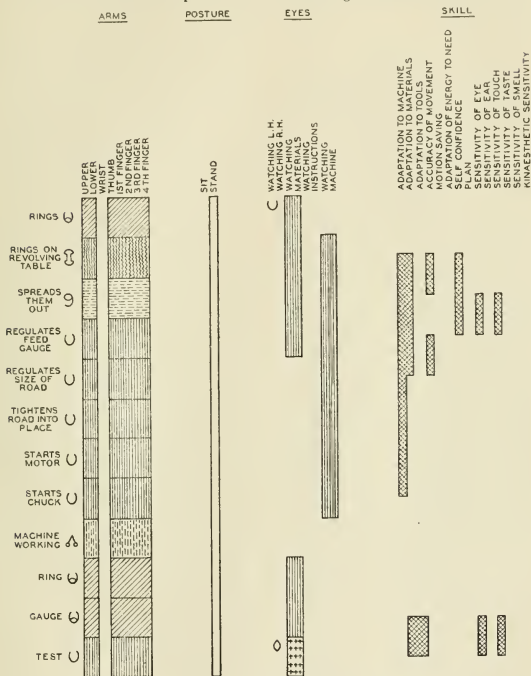


FIG. 3

Self confidence represents his ability which rises from mastery of technique or knowledge of operation to proceed without hesitation or fear directly to the conclusion of a performance.

Plan refers to his ability to prepare and to organize in advance the various neuromuscular "sets" required for a particular performance; a prepositioning of the organism.

The sensitivities of eye, ear, touch, etc. refer to the developed power of discrimination of the given sense organ or organs trained by habitual use to test a given muscular procedure.²⁹

The simo-skill-chart presents, therefore, a picture both of the job performed, and of the skill shown by the workman performing it.³⁰ Illustration will make the method clearer. In the chart shown (see fig. 3), an operation is pictured upon a surface grinder, in which a ring for a deep-groove ball bearing is ground in a Blanchard automatic machine. The operator places a number of rings on the large tray of a revolving table, called the chuck. He spreads them out rapidly seeing that each lies flat in a proper position to meet the grinding wheel. He then (1) regulates the feed gauge of his machine which determines the rate at which the rings shall pass across the grinding wheel; (2) regulates, to fit the size of the ring, the track or road upon which they must pass; (3) starts the motor of his machine; and (4) starts the table revolving to carry the rings under the grinding wheel. The machine carries on the rest of the operation, so that the only further requirement from the workman is to test a ring with his gauge at the finish of the operation to make certain that the grinding has been correct.

The process chart, (fig. 1) analyzed

the operation in detail. In making the simo-skill chart from the process chart, the steps of the operation appear in detail at the left of the chart. (See fig. 3). Each movement is pictured by its appropriate therblig, which is represented as a unit of uniform but arbitrary length. The skill which the workman exhibits during the performance is charted at the right of the chart. Each skill-factor observed during the course of any particular movement is charted opposite the therblig which represents the movement.

In this process recorded in fig. 3, during the first two movements, that is, during the transporting of the rings from the tray in which they are brought (designated on the chart by the notation "rings" and the therblig "transport-loaded"); see page 39 for symbols representing the therbligs and the placing of the rings upon the revolving table (designated on the chart by the notation "rings on revolving table" and the therblig "preposition"), no skill as defined in this study is displayed by the workman and none is charted. During the third movement, that is, the arrangement of the rings upon the table to meet the grinding wheel of the machine (designated on the chart by the notation "spreads them out," and by the therblig "position"), four skill-factors are noted: adaptation to machine, adaptation to material, motion saving, and self-confidence. These are charted as units of skill opposite the therblig "position." During the next movement, the regulating of the feed gauge, (designated on the chart by the notation "regulates feed gauge" and by the therblig "use"), five skill-factors are noted; adaptation to machine, adaptation to material, self-confidence, sensi-

²⁹ Further discussion of these definitions will occur in the course of the presentation.

³⁰ See also, for a description of this method: Mildred Fairchild. *Study of Industrial Processes as a Tool in the Training of Social Workers. Proceedings, The National Conference for Social Work*, Memphis, Tenn., 1928, pp. 577-586. Certain changes of terms used in this article have been made as being more in accordance with precise meaning.

tivity of eye, and sensitivity of touch. These are charted opposite the therblig. The analysis of the entire operation follows along the same line, as the chart indicates. Charting the eyes under the column "eyes" employs the therblig symbols and follows the regular procedure of the simo-chart. The only significance of the eyes in this operation, other than their regular use (designated on the chart by the therblig "use," lies in the therblig "inspect," at the close of the operation when the ring is tested.

THE THERBLIG-SKILL-AVERAGE

When the chart is completed, the number of therbligs employed and the number of skill-factors noted (each skill-factor used during the course of one therblig being counted as a unit) are totaled. The total number of skill-factors charted, divided by the total number of therbligs charted, gives the average number of skill-factors observed per therblig, or the therblig-skill-average of the workman. In the chart pictured (fig. 3) the total number of therbligs is 12, the total number of skill-factor units is 20, and the therblig-skill-average amounts to 1.67. Decimals were carried to three places and corrected to two.

The skill shown, it must be remembered, is not simply the observation of the skill required for the performance of that operation, nor of the individual skill of the workman performing it beyond the minimum requirements of the job. It is the sum of both these; it is the observation of the total skill shown in performance. The performance is that of a man who, in the judgment of the management, is a "good-

average" workman, on a job typical of light machine-shop work in each plant.

THE RELIABILITY OF THE METHOD OF RESEARCH

The investigators were assigned, one to each of three plants and two to the fourth or largest of the plants and the one containing the most elaborate operations. A number of devices were used to achieve reliability and validity in the method of research. (1) Careful training in the making of process charts and the use of the therblig in simo-charts was given by Dr. Gilbreth herself. (2) The work of the students was supervised and checked meticulously in the seminary by Dr. Kingsbury. The analysis of the skill-factors and the nature of the skill to be observed were discussed constantly in the laboratory, while the method of simo-skill-charting was experimented upon within the group as it was developed. All simo-skill-charting was done in the laboratory and under careful supervision. (3) The writer served as director of field and laboratory research. She worked with an investigator in one of the plants and observed the others throughout the course of the study. She provided a connecting link between the other investigators and between factories, and she supervised laboratory work to see that it was as uniform and as consistent as possible. (4) Finally, moving pictures were taken of two operations in each plant, in accordance with the Gilbreth micro-motion film technique, and the films were analyzed and charted into simo-skill-charts in order to verify the accuracy of the investigators' work.

Four safeguards were thus used to secure as great a degree of reliability and consistency as possible. At the close of the study any charts which seemed, in spite of previous efforts, to contain inconsistencies were rechecked either by the original investigator, or by another investigator who already was, or became familiar with the technique and the operation charted.

Even with such safeguards, a considerable degree of subjectivity necessarily was present in the observation and judgment of skill-factors. An effort was made to develop a completely objective definition of each skill-factor and of how it could be detected. The effort aided materially in the study but it was not possible to develop it to the point desired during the course of this study. Another time it should be continued for a more complete application. The results of the charting, nevertheless, were uniform enough to warrant their careful analysis and interpretation.

THE TWENTY-FOUR-HOUR PICTURE OF THE WORKMAN

Supplementing and verifying the simo-skill-chart study of the workman and his job, the investigators carried on a sociological investigation both into the conditions of work and into what was termed the "twenty-four hour picture of the workman." The first was accomplished by a rapid but careful plant survey on the basis of a factory schedule prepared for the purpose.³¹ The second was obtained for the most part by interviews with

the workmen, but was supplemented at certain points by the employment records of the firm, and at certain other points by the statements of the management, superintendent, foremen, employment manager and plant nurse. The information about the workmen was summed up in the workers' schedule also drawn up for the purpose.³²

The handling of the schedule information was facilitated first, by tabulating the obtained facts in the usual fashion, and, second, by totalling the ratings given and reducing these totals to a percentage basis, considering the total score possible under the rating scheme as 100. A detailed discussion of each rating will be given in Part II, so that further explanation at this point is hardly necessary. The material was by this treatment available for statistical comparison and correlation as well as for case study.

The material of the study thus resolved into two forms: first, the simo-chart of the jobs and the skill shown in their performance, and second, the schedule based on the interviews with the workmen. With such a mass of material for even a limited number of cases, the analysis and interpretation of the information secured constituted a serious problem. The nature of the study demanded both case treatment and statistical analysis. The two methods were used to supplement each other throughout the study.³³

³² See Appendix B, page 64, for workers' schedules.

³¹ See Appendix A, page 57. Certain schedules for the study of personnel methods in use in the Carola Woerishoffer Graduate Department, Bryn Mawr College, and the Gilbreth schedule for the study of fatigue were used as a basis for framing the schedules for this study.

³³ Much argument has occurred within recent years over the case method versus the statistical method for social research. This study demonstrates the natural dovetailing of the two methods, each for its respective purpose.

3. THE SKILL-INDEX

The first step in analysis of the material acquired for this study was to obtain from the simo-skill-chart an index of the skill of the workman in relation to his job. The therblig-skill-average supplied the means, and the ratio of the therblig-skill-average of each man to a norm therblig-skill-average of the group of workmen to which his work was comparable, supplied the skill-index needed.

The method of obtaining the norm therblig-skill-average is of importance. The sum of all the skill-factors observed among all the men of the class to be compared was divided by the sum of all the therbligs appearing in their operations, thus giving norms based upon much larger numbers of units than the number of men or of operations in the class, in some cases running into the hundreds and thousands. The norm used was thus a better type of norm, even with the limited number of cases studied, than a mean of the therblig-skill-averages of the men could have been, and was more statistically sound.

THE FORMULAE FOR THE SKILL-INDEX

Thus the formula for the skill-index reads:

$$S.I. = \frac{S}{T} \div \frac{\Sigma S}{\Sigma T}$$

where S.I. = skill index

S = units of skill on one job

T = therbligs on one job

ΣS = total units of skill in all operations under comparison

ΣT = total therbligs appearing in these operations

By relating the therblig-skill-averages to a common base, a series of three indexes was established. The first index relates the workman's therblig-skill-average to the average for all the men on similar machines. The subscript 1 indicates that the index series refers to work on the same machines within the same shop.

Formula 1:

$$S.I._1 = \frac{S}{T} \div \frac{\Sigma S_1}{\Sigma T_1} = \frac{S \times \Sigma T_1}{T \times \Sigma S_1}$$

See also footnote 34

where S = the total number of skill factors appearing in any one job performed by any one man;

T = the total number of therbligs in the same job;

ΣS_1 = the total number of skill factor units appearing in all the jobs performed by men doing similar work; and

ΣT_1 = the total number of therbligs in the same jobs.

The second index series relates the workman's therblig-skill-average to the average for all men in the shop. The same symbols hold as before; the subscript 2 designates all selected work within the shop.

³⁴ An effort was made to weight the various skill-factors, i.e., A, B, etc., by the importance of these skill-factors in the total number of like operations used as a base for the index. The skill index thus became:

$$S.I. = \frac{\left[\left(\frac{S_A}{T} \cdot \frac{\Sigma S_A}{\Sigma S} \right) + \left(\frac{S_B}{T} \cdot \frac{\Sigma S_B}{\Sigma S} \right) \text{ etc.} \right]}{\left[\left(\frac{\Sigma S_A}{\Sigma T} \cdot \frac{\Sigma S_A}{\Sigma S} \right) + \left(\frac{\Sigma S_B}{\Sigma T} \cdot \frac{\Sigma S_B}{\Sigma S} \right) \text{ etc.} \right]}$$

The limited number of cases, whereby norms could be discovered, made the weighting unreliable for this study.

Formula 2:

$$S.I._2 = \frac{S}{T} \div \frac{\Sigma S_2}{\Sigma T_2} = \frac{S \times \Sigma T_2}{T \times \Sigma S_2}$$

The third series relates the workman's therblig-skill-average to the average for all the men included in the study in the four plants. The subscript 3 designates all work studied.

Formula 3:

$$S.I._3 = \frac{S}{T} \div \frac{\Sigma S_3}{\Sigma T_3} = \frac{S \times \Sigma T_3}{T \times \Sigma S_3}$$

SKILL-FACTORS ON DIFFERENT MACHINES

The principle on which these indexes are founded is simple enough, but the choice of the common bases for comparison immediately give rise to two questions. The first is whether there is proof that a skill-factor as it actually appears in one man's work is like the same skill-factor in another man's work. Adaptation to machine may or may not be physiologically and psychologically identical for different individuals. Certainly it is true that this method makes no effort to identify the various muscle and nerve reactions used by different persons to produce a given result. That remains, if it seems necessary, for future research. The likeness of resulting performance, however, seems to the writer to justify comparison between men doing the same work.

The second question is more serious, namely, whether there is identity between a skill-factor in work performed on one type of machine, such as the engine lathe, and the same skill-factor in that performed on another type, such as the drill press. The basis of Formulae 2 and 3 rests upon an as-

sumption that there is, if not identity, at least an element common enough to all to make them comparable. The comparison of the workman's skill entering into indexes 2 and 3 rests on the assumption that the relation between the same skill-factors used on the different machines included in the selection is primarily a quantitative relation. That is, the nature of the skill-factor utilized to operate one machine would be comparable to that used to operate another. The primary difference between them is that a greater amount of any one skill-factor at a given moment would usually be required to operate the more complex machine, such as one of the various lathes, than would be necessary to operate the simpler machine, such as the drill press.

It will be remembered that the skill analysis and skill charting provide no satisfactory measure of the amount of any skill-factor used at a given moment. It is possible at present to note adaptation to machine in relation to a given therblig, for example, but not the amount of adaptation used. Were the amount measurable, it would certainly be found to increase with the operation of the more complex machines. But the nature of the skill-factors as shown in the operation of one machine is comparable to that shown in the operation of another.

IS SKILL TRANSFERABLE?

In the opinion of experts in machine-shop work, the nature of the skill required to perform one portion of the machinists' trade is similar to that required for another. A common element may be assumed if a transfer of

the skill attained takes place as a workman changes from one machine to another. And a certain amount of such transfer within the trade does occur, in the opinion of experts.³⁵

The man who has learned to operate a drill press, for example, will transfer a large part of his skill upon it to the new operation when he begins to operate a milling machine and lathe. The new learning process will consist of that transfer plus a new increment of control necessary to handle the more difficult and complicated machine. The transfer will probably not be complete for all of the skill-factors. Adaptation to machine, adaptation to tools, and self-confidence, at least, will require some readjustment and adaptation on the part of the workman as he begins to operate the new and more complicated machine. And his success in it will depend upon his general adaptability and attitude. But for most of the skill-factors, a considerable degree of transfer may be expected.

The whole question of the transferability of skill is far from settled. Recent studies by Farmer³⁶ indicate a common element of accurate and rapid coördination in response to a given stimulus in certain of the higher grades of skilled performance. Moreover, within similar fields of work a transferability of attitudes and sentiments, or of knowledge of methods

"where the particular function trained was the vehicle of these mental powers" has been thought probable.³⁷

On the other hand, a study made at the University of Manchester, which correlated tests of production capacity on various simple operations requiring one type or another of motor skill,³⁸ brought out little evidence of a transfer of skill between the types of operations studied. The man who could pass one type of simple motor test could not necessarily pass another, nor did training upon one type of operation necessarily help him when he came to perform another. The operations studied, however, were very simple indeed, requiring a type of skill so elementary that it is questionable whether it could be counted as more than a manual or finger dexterity.

But the man who bores a hole in a bit of cast iron, the man who faces it, and the man who turns and trims it down are using higher grades of skill. Moreover, after careful observation and analysis, the greatest difference in the skills required upon these machines seems to rest in the amount of adaptation required.

The assumption of transferability in

³⁷ T. H. Pear. The Nature of Skill. *Journal of the National Institute of Industrial Psychology*, October 1928, vol. 4, no. 4, p. 202.

³⁸ For a full description of these tests and their results, see J. N. Langdon and Edna M. Yates, previous citation. See also B. Muscio. Motor Capacity with Special reference to Vocational Guidance. *British Journal of Psychology*, 1922-23, vol. 13, pp. 157-184; F. A. C. Perrin, *Journal of Experimental Psychology*, 1921, vol. 4, pp. 24-56; and H. L. Hollingworth. *Journal of Educational Psychology*, 1913, vol. 4, pp. 405-414, quoted by Mr. Muscio.

³⁵ The writer wishes especially to thank Mr. L. C. Morrow and Mr. Fred W. Colvin, editors of *The American Machinist*, and also Prof. Joseph W. Roe, of New York University, for consideration and advice upon this topic.

³⁶ E. A. Farmer. A Group Factor in Sensory-Motor Tests. *British Journal of Psychology*, April 1927, vol. 17, pp. 327-334.

this study, therefore, is based upon the fact that it deals with so-called higher grades of skilled performance and upon the closeness of the relation between the branches of the machine-shop trade. On that basis, formulae 2 and 3 and their resulting indexes are justified.

Nevertheless, even though the assumption of transferability of skill in this case be justified, the formulae used do not indicate the full difference in quantitative terms which exists between therblig-skill-averages shown by workmen on different machines. A study of the therblig-skill-averages by one who knows the machines will indicate, however, that the variation which exists in the quality of the skill-factors would in quantitative terms only increase the variation now apparent.²⁹ In other words, a quantitative weight might correct the error if a logical one could be found. Such a weight might be formed by multiplying the therblig-skill-average of the workman by the ratio between the mean therblig-skill-average of all men on one machine and that of all men studied in the shop. The weight, by such a method, while it would not measure the exact difference in skill-factors occurring, would nevertheless indicate something of their correct variation.

Formula 2 would then become:

Formula 4:

$$S.I._4 = \frac{S}{T} \div \frac{\sum S_2}{\sum T_2} \times \left(\frac{\sum S_1}{\sum T_1} \div \frac{\sum S_2}{\sum T_2} \right)$$

or,

$$= \frac{S \times \sum S_1 \times (\sum T_2)^2}{T \times \sum T_1 \times (\sum S_2)^2}$$

In like fashion, Formula 3 would become:

$$S.I._5 = \frac{S}{T} \div \frac{\sum S_3}{\sum T_3} \times \left(\frac{\sum S_1}{\sum T_1} \div \frac{\sum S_2}{\sum T_2} \right)$$

or,

Formula 5:

$$\frac{S \times \sum S_1 \times \sum T_2 \times \sum T_3}{T \times \sum T_1 \times \sum S_2 \times \sum S_3}$$

On the bases of these formulae, S.I.₂ and S.I.₃ are merely a comparison of simple therblig-skill-averages with no effort to reduce them to common terms. S.I.₄ and S.I.₅, on the other hand, attempt to allow for the additional inherent variation within the skill-factors by a quantitative weighting system. But in the opinion of the writer the unweighted indexes are as logical as the weighted ones. Until further definite relationships between the same skill-factor on different machines can be determined by research, it is essential only that the limitations of the indexes be clearly understood.

THE SKILL INDEXES

When the indexes for all the workmen studied in the four plants are arranged in comparative order, the result is striking, as a study of Tables I and II shows at once. The therblig-skill-averages of the workmen tend to increase, with a few exceptions, from those used on the punch press, through drill press, grinders, planer, milling machine, engraving machine, grooving machine, horizontal boring mill, hand-screw machine and lathes. The order is very close indeed to the accepted grading of the machines by industrialists. Operators of turret lathes, it is true, rank higher in therblig-skill-average throughout than do those on engine lathes. But in every case the men who operate also set up the machines, so that first-rate men are employed upon the turret lathes and therefore merit the rank given them. Moreover, in both Plant C and Plant D, two of the three men operating engine lathes were not of first rank as based on their production standing, and they

²⁹ See Table II.

TABLE I

Therblig-skill-averages and skill-indexes of selected workmen in the four plants

NUMBER IN FACTORY	WORKMAN SERIAL	MACHINE	MACHINE SERIAL	THERBLIG- SKILL- AVERAGE	S.I. ^a	S.I. ^b	S.I. ^c
PLANT A							
1	10	Grinder	VI d	0.79	74	32	22
2	8	Grinder	VI c	1.11	61	51	35
3	12	Grinder	VI d	1.30	121	59	41
4	5	Grinder	VI b	1.42	64	67	46
5	9	Grinder	VI d	1.66	156	76	52
6	26	Punch press	XII	1.75	96	80	55
7	28	Punch press	XII	1.83	111	84	58
8	27	Punch press	XII	1.87	102	85	59
9	6	Grinder	VI c	1.93	107	89	61
10	17	Engine lathe	IX a	2.00	86	91	63
11	20	Engine lathe	IX a	2.30	99	105	72
12	18	Engine lathe	IX a	2.36	101	107	74
13	19	Engine lathe	IX a	2.35	101	107	74
14	7	Grinder	VI a	2.25	129	107	74
15	22	Turret lathe	IX b	2.18	96	113	78
16	25	Turret lathe	IX b	2.54	98	116	80
17	3	Grinder	VI b	2.57	111	116	80
18	13	Groover	VII	2.60	93	119	82
19	4	Grinder	VI b	2.65	114	120	83
20	24	Turret lathe	IX b	2.68	104	123	85
21	21	Engine lathe	IX a	2.90	124	131	90
22	14	Groover	VII	2.88	103	132	91
23	15	Groover	VII	2.94	105	134	92
Mean.....				2.19		97.6	67.2
S.D.....						26.9	18.5
Median.....						107	74
L.Q.....						80	55
U.Q.....						119	82
Q.D.....						19.5	13.5
PLANT B							
1	34	Drill press	IV	0.47	23	15	15
2	36	Engraver	V	0.96	40	30	30
3	43	Punch press	XII	1.33	76	40	41
4	40	Engraver	V	1.32	56	41	41
5	44	Punch press	XII	2.38	136	72	73
6	38	Engraver	V	2.77	117	85	87
7	35	Drill press	IV	2.83	136	87	88
8	39	Engraver	V	3.42	144	105	107
9	37	Engraver	V	3.53	149	108	110
10	31	Assembly	I	3.64	89	110	
11	33	Assembly	I	3.68	90	112	
12	41	Hand screw	VIII	3.75	95	115	117

TABLE I—Continued

NUMBER IN FACTORY	WORKMAN SERIAL	MACHINE	MACHINE SERIAL	THERMIG SKILL AVERAGE	SL ₁ *	SL ₂ *	SL ₃ *
13	30	Assembly	I	3.94	97	120	
14	42	Hand screw	VIII	4.25	107	129	132
15	32	Assembly	I	4.35	107	133	
Mean.....				2.50		86.8	76.4
S.D.....						37.1	37.5
Median.....						105	87
L.Q.....						41	41
U.Q.....						115	110
Q.D.....						37	34.5

PLANT C

1	45	Drill press	IV	1.40	63	43	43
2	77	Milling machine	X a	2.23	77	68	69
3	48	Engine lathe	IX a	2.30	75	72	73
4	49	Engine lathe	IX a	2.34	76	73	74
5	76	Milling machine	X a	2.37	88	73	74
6	53	Ingersol	X b	3.26	112	101	102
7	50	Turret lathe	IX b	3.17	90	101	102
8	51	Turret lathe	IX b	3.56	99	111	112
9	46	Drill press	IV	3.91	175	121	122
10	52	Turret lathe	IX b	4.47	117	131	132
11	47	Engine lathe	IX a	4.59	148	142	143
Mean.....				3.22		94.2	95.1
S.D.....						29.3	29.4
Median.....						101	102
L.Q.....						72	73
U.Q.....						121	122
Q.D.....						24.5	24.5

PLANT D

1	58	Drill press	IV	2.20	95	63	67
2	57	Drill press	IV	2.38	98	65	71
3	59	Drill press	IV	2.15	106	70	75
4	62	Grinder	VI d	2.58	95	76	81
5	72	Milling machine	X a	2.60	76	77	82
6	64	Engine lathe	IX a	2.89	77	80	86
7	60	Grinder	VI d	2.83	104	83	89
8	74	Planer	XI	2.97	100	87	93
9	56	Horizontal bore	III	3.02	79	91	97
10	71	Milling machine	X	3.16	92	93	100
11	65	Engine lathe	IX a	3.18	90	94	101
12	70	Milling machine	X	3.31	96	97	104
13	59b	Drill press	IV	3.69	100	107	114
14	73	Milling machine	X	4.04	117	118	126

TABLE I—*Concluded*

NUMBER IN FACTORY	WORKMAN SERIAL	MACHINE	MACHINE SERIAL	THERBLIG- SERIAL AVERAGE	S.I. ₁ *	S.I. ₂ *	S.I. ₃ *
15	55	Horizontal bore	III	4.18	106	122	130
16	54	Horizontal bore	III	4.35	110	126	135
17	66	Turret lathe	IX b	4.29	91	127	136
18	63	Engine lathe	IX a	4.35	123	128	137
19	67	Turret lathe	IX b	4.13	92	129	138
20	68	Turret lathe	IX b	4.85	102	143	153
21	69	Turret lathe	IX b	5.89	123	172	184
Mean.....				3.41		102.3	108.5
S.D.....						29.8	28.6
Median.....						94	101
L.Q.....						78.5	84
U.Q.....						126.5	135.5
Q.D.....						24	25.75

* S.I.₁ is the skill index process base; S.I.₂ is the skill index factory base; S.I.₃ is the skill index inter-factory base.

TABLE II
Therblig-skill-averages for plants and machines

MACHINES	S/T FOR GIVEN PLANT			
	A	B	C	D
Plant average (all machines).....	2.19	2.50	3.22	3.41
Punch press.....	1.82	1.75		
Drill press*.....		2.08	2.23	2.32
Grinders.....				2.72
Grinders I.D.....	2.32			
Grinders O.D.....	1.81			
Grinders Surface.....	1.07			
Planer.....				2.97
Milling.....			2.91	3.44
Engraving.....		2.37		
Grooving.....	2.80			
Hand screw.....		3.95		
Lathe,				
Engine.....	2.33		3.09	3.54
Turret.....	2.58		3.61	4.76
Horizontal boring mill.....				3.94

* These figures for Plant D do not include 59_b, the more skilled work done by one operator. The average including 59_b becomes 2.88.

brought down the average for the group below the level it would probably have reached had the workmen

been the equivalent of those selected from among turret-lathe operators. The therblig-skill-averages of workmen

from machine to machine show very much the variation, that experts acquainted with the machines might expect.

A similar rise in scale is apparent in the therblig-skill-averages shown by workmen upon the same machine between plants. It should be realized here, however, that the machines are never quite the same. Difference in size of work and difference in variety of product demand considerable variation, in a turret lathe, for example, or perhaps even more strikingly in a drill press, from plant to plant. Comparisons of individuals between the plants should, therefore, be only of a general nature. On the whole it would seem reasonable to assume on the basis of therblig-skill-averages that workmen in Plant D possess a higher average skill than workmen in Plant A, and that also on like machines. A workman operating a turret lathe in Plant D may be considered as showing more skill than a workman operating a similar machine in Plant A. And the mean skill of all workman in Plant D may be considered superior to that of all workmen in Plant A.

More detailed comparison is probably not justified. Whether or not, for example, the man with a higher therblig-skill-average in Plant A is a superior workman to a man with a lower therblig-skill-average in Plant D can hardly be determined. The significance of the figures rests not so much in individual rank as in trends and averages.

Equally impressive is the wide range of therblig-skill-averages shown by workmen in each of the four plants, and the relative positions of the means

and medians. The mean S.I.₃ appears for the four plants at 67.2, 76.4, 95.1 and 108.5, with standard deviations of 18.5, 37.5, 39.4, and 28.6 respectively. The medians vary also and are somewhat comparable, 74, 87, 102 and 101, with quartile deviations of 13.5, 34.5, 24.5 and 25.75 respectively.

Two facts stand out in a study of the ranges. The first is the great spread of the unweighted inter-factory skill index (S.I.₃). In Plant A it amounts to 70 points, in Plants B and D to 117 points, and in Plant C to 100 points. The spread is surprising in Plant A. It is a plant where skill is discounted as an almost negligible quality, and where six weeks is considered the limit of training time needed for proficiency in most of the work performed. One might reasonably expect, therefore, comparatively little variation in the skill shown. Yet the S.I.₂ shows a range of 102 points and the S.I.₃ of 70 points. The figures would indicate a higher range of skill among the workmen than either management or men appear to realize. The repetitive nature of the task possibly makes it so much an integral part of a man's habitual routine that he ceases often to be conscious of his performance as a skillful one.

In Plant B, the youth of a number of the selected workers (they included three apprentices) undoubtedly influenced the range here shown, and so increased the spread. Of the two lowest indexes, one is that of a youth under 20, the other of a learner not yet fully adapted to the job. The age of the selected workmen is, nevertheless, typical of the section of the plant studied.

Not all of the apprentices, however, appear in the lower ranks.⁴⁰ them which emphasizes their relation to one another.⁴¹

Altogether, the range of the un- While considering the basis of the

TABLE III
Factory and inter-factory skill indexes of four plants

INDEXES	TOTAL	PLANTS			
		A	B	C	D
S.I. ₂					
Total.....	75	27	15	11	22
1-25	1		1		
25-50	5	1	3	1	
50-75	11	3	1	4	3
75-100	17	6	2		9
100-125	23	10	6	4	3
125-150	12	3	2	2	5
150-175	1				1
175-200					
Not given	5	4			1
S.I. ₃					
Total.....	75	27	15	11	22
1-25	2	1	1		
25-50	7	3	3	1	
50-75	17	10	1	4	2
75-100	18	9	2		7
100-125	11		3	4	4
125-150	9		1	2	6
150-175	1				1
175-200	1				1
Not given	9	4	4*		1

* Assembly indexes not included in inter-factory index.

weighted indexes is a wide one. Table III gives a frequency grouping of skill index, it is necessary to note that the charts from which the therblig-

⁴⁰ Thus, if the lower 4 in Plant B were omitted, the minimum S.I.₃ would be above the mean and almost at the median of Plant A, and the median would equal that of Plants C and D. Tables in an Appendix which will appear in the next issue of the PERSONNEL JOURNAL will give detail of selected workmen.

⁴¹ The range of indexes, by the nature of the formulae, becomes greater with the weightings. And since the weight represents only the index value for each machine in relation to the rest of the plant, it offers no advantage for comparison of indexes between plants. Nor is such additional weighting possible without further research.

skill-averages here presented were formed were charts of operations upon the machines studied, not of set-ups, that is not of the preparation of the machine for operation. With certain exceptions in Plant D, where the set-up of the machine seemed an integral part of the operation, charts of the setting-up of the machine were not included in the computed skill indexes.

Such charts were made of work upon all the machines studied in Plant A—the plant which requires the most repetitive work among the four plants studied—and since in all cases among the selected workmen the set-ups were performed by the operators themselves and not by a specialist or foreman, the therblig-skill-averages shown by the charts were noteworthy. They were as follows:

Grinder, I.D.....	3.04
Grinder, O.D.....	{ 3.35 2.46
Grinder, surface.....	2.12
Grooving.....	{ 2.65 2.75 2.87
Lathes, engine.....	{ 2.59 2.50 2.83
Lathes, turret.....	2.96
Punch press.....	2.38
Average for plant.....	2.74

The mean therblig-skill-average, 2.74, is not much greater than that for the operations, 2.19. While it exceeds the average of Plant B, it does not approach that of Plant C, and were the set-up combined with the operation, the average would not pass that of Plant B.

At the same time, apparently, the set-ups tend to require a greater total skill from the workmen than do the operations at Plant A, a relation which in the few cases studied did not necessarily exist in Plant D. Set-up charts were not attempted at either Plant B or Plant C. Possibly, therefore, a complete inclusion of set-up therblig-skill-averages would somewhat alter the exact relation of the plants one to another. But knowledge of the shops and work would lead one to doubt whether that alteration would be extensive. Moreover, motion study of a machine set-up is not satisfactory at present. The job is entirely too long to chart effectively or conveniently, and too varied to sample.

Finally, the limited number of workmen studied from each type of machine operator makes the norms and index bases uncertain and incomplete. Under no circumstances should anyone consider these norms as absolute or conclusive, but rather as experimental and tentative.

But certain relations have stood out as extraordinarily significant, and provocative for further research. The skill-index provides an evaluation of a workman's skill in relation to that of his fellows which, though still inexact, is highly suggestive. Not only do the individual indexes seem, on the whole, close to an evaluation one might expect, but a study of their ranges and of their relation to one another presents a striking picture. The relation of the skill-indexes of workmen operating complex machines to those operating simple ones, and the variation of indexes of workmen from plant to plant are worth careful attention. They will be considered further.

APPENDIX A

SPECIALIZATION IN THE METAL TRADES AND ITS EFFECT ON SKILL AND SATISFACTION
FACTORY SCHEDULE

- Introduction. History and Type
- A. Approach to Plant, and Plant (general)
 - B. Product
 - C. Organization of Plant—Department
 1. Shop
 2. Management
 - D. Personnel
 1. Employment
 2. Training
 3. Service
 4. Benefits, Pensions and Insurance
 5. Industrial Relations
 - E. Process (selective). To be studied for the purpose of understanding the worker in relation to his job.
 1. Major Processes
 2. Selected Processes

A. APPROACH AND PLANT (GENERAL)

(See Gilbreth, Fatigue Survey, I, II, pp. 1-2)

I. APPROACH

1. Community
 - 1) Nationality.....
 - 2) Type: Urban..... Village..... Rural.....
 - 3) Population.....
2. Transportation
 - 1) Method: Railroad..... Trolley..... Bus..... Elevated.....
 - 2) Traffic condition in towns: Crowded..... Normal..... Quiet.....
3. Housing
 - 1) Type: one family..... semidetached..... row or group..... single duplex..... double duplex..... row duplex..... tenement.....
 - 2) Resources: Plentiful..... Normal..... Scarce.....
 - 3) Conditions: Good..... Excellent..... Fair..... Poor.....
 - 4) Ownership: Plant..... Worker..... Rented.....
4. Social Service
 - 1) School: Elementary..... High..... Night..... Continuation..... Workers or Adult..... Technical or Trade.....
 - 2) Recreation: Play grounds..... Societies..... Clubs..... Amusement places.....
 - 3) Churches: Denominations.....
 - 4) Social Service: Hospital..... Visiting nurse..... Family care..... Child care.....

II. PLANT

1. Surroundings: Space around works..... Used for gardening..... Games field..... Parking..... Nothing.....
2. Buildings: Outside
 - 1) Number..... 2) General Condition: Crowded..... Well spaced..... New..... Old..... 3) Repair.....

3. Buildings: Inside (Gilbreth, Pp. 17-18)

- | | | |
|--|----------------------------|-----------|
| 1) Repair | | |
| 2) Lighting: a) Windows: Good | Fair..... | Poor..... |
| b) Skylight: Yes..... | No..... | |
| c) Adequacy: Good..... | Fair..... | Poor..... |
| d) Quality: Good..... | Fair..... | Poor..... |
| e) Ceiling, Wall, Floor, etc.: Good..... | Fair..... | Poor..... |
| f) Obstructions..... | | |
| 3) Location of stairs and elevators: good..... | Fair..... | Poor..... |
| 4) Housekeeping: Good..... | Fair..... | Poor..... |
| 5) Safety devices: Adequate..... | Inadequate..... | |
| 4. Entrances: For visitors..... | Employment department..... | |
| Executive and office..... | Employees..... | |
| Special departments..... | | |
| 5. Parking places: Shed..... | Enclosed space..... | |
| Hired by employees..... | Free..... | |

B. PRODUCT (REPORT OR CATALOGUE)

I. CLASSES OF PRODUCT

1. Primary: List number and variety of types.....
-
2. Supplementary: List number and variety of types.....
-

II. TYPE OF ORDER

1. Standard goods.....
2. Manufactured to order.....
 - 1) Design specification with order.....
 - 2) Design by company.....

III. PRODUCTION STANDARD PARTS

1. For market.....
2. For inventory (Used to stabilize fluctuations?).....

IV. OUTPUT

1. Average quantity per month of each class (if obtainable): Primary.....
- Supplementary.....
2. Average value per month (if obtainable)
 - 1) Total.....
 - 2) Each class: Primary..... Supplementary.....
 - 3) Total value output last year (if obtainable).....

V. MARKET

1. Locations.....
2. Seasonal variations in demand:.....
 - 1) When peaks.....
 - 2) When slacks.....
3. Fluctuating variation in demand.....

C. ORGANIZATION OF PLANT—DEPARTMENT

(See if firm has charts)

I. SHOP DEPARTMENTS—CHART LIST

1. General.....
2. Selected for study.....
3. Allied to those selected for study.....

II. MANAGEMENT DEPARTMENTS—CHART

1. Business
 - 1) Finance.....
 - 2) Purchase.....
 - 3) Sales.....
 - 4) Other.....
2. Planning: (List functions on attached sheet).....
3. Production Engineering:
 - 1) Time study (describe).....
 - a) Methods.....
 - b) Extent.....
 - c) How often revised?.....
 - d) Basis of payment resulting.....
 - e) Job specifications included.....
 - 2) Other schemes.....
4. Personnel—List
 - 1) Employment.....
 - 2) Service.....
 - 3) Training.....
 - 4) Industrial Relations.....
 - 5) Other (specify).....

III. INTERPLANT ORGANIZATION

1. If company has other plants, fill in the following table:

	A	B	C	D	E
Name					
Location					
Product					
Size: No. employees					
Value of output					

2. Alliance with other companies.....

(Gilbreth III and the two Department Personnel Schedules)

D. PERSONNEL

I. EMPLOYEES

1. Employees:
 - 1) Number.....

Day work.....	Piece work.....
Men.....	Women.....
 - 2) Wages:
 - a) Day work: Maximum.....Average.....Minimum.....
 - b) Piece work, day earnings: Maximum.....Average.....Minimum.....

- c) Bonus weekly: Maximum.....Average.....Minimum.....
- d) Regularity: Steady.....Intermittant.....Seasons.....
- 3) Hours of work:
 - a) Number: Daily.....Weekly.....
 - b) Daily: Beginning.....Ending.....
 - c) Saturday: Beginning.....Ending.....
 - d) Noon hour.....e) Rest Periods.....
 - f) Overtime work.....g) Night work.....
- 2. Protections:
 - 1) Fire:
 - a) Plant fire department: Permanent.....Volunteer.....
 - b) Municipal fire department: Near.....Far.....
 - 2) Safety:
 - a) Council: Department committee.....
 - Safety engineer.....

II. EMPLOYMENT

- 1. Name of Department.....Title.....
- 2. Functions Exercised.....
 - 1) Requisition for labor needed?.....
 - 2) Chief sources of labor supply.....
 - 3) Interview: Private?.....With others in room?.....
 - How conducted?.....
 - 4) Is foreman consulted before person is finally hired?.....
 - 5) Application blank on file for employee?.....
 - 6) Pre-employment tests: *Physical*, for what employees?.....
 - How thorough?.....Purpose?.....
 - Trade tests*, for what employees?.....
 - What test used?.....
 - General Intelligence Test*, for what employees?.....
 - What test used?.....
 - 7) References required, for which employees?.....
 - From whom?.....
 - 8) Introduction to the job: by whom?.....
 - General instructions about rules, lunch rooms, washrooms, plant organization, etc.....
 - 9) Attach copy of employment record.....

III. EDUCATION

- 1. Training:
 - 1) Vestibule Schools: a) What occupations.....
 - b) Period of training.....
 - c) Wages paid.....
 - d) Who instructs?.....
 - e) Who is taught?.....
 - f) Equipment?.....
 - 2) Apprenticeship system: a) List departments.....
 - b) Number apprentices each department?.....Total.....
 - c) How long operating.....

- d) Conducted by plant alone?.....
- In conjunction with Metal Trades Associations?.....
- e) What per cent of present employees apprentice trained this plant?...
- In what departments do they work now?.....
-
- f) Describe courses (attach description or analysis).....
- 3) Systematic up-grade training.....
- 4) Other systems.....
- 5) Foreman training.....
- 6) Other education offered.....
-
- 2. Follow up of New Employees:
- 1) Rating system (describe).....
-
- 2) Tests during service.....
-
- 3) Continuation of training required.....
-
- 4) Other plans.....
-
- 3. Transfer and Promotion System:
- 1) Describe method.....
- 2) Basis for promotion: length of service.....merit.....
- 3) Whose judgment used?.....
- 4) How are employees acquainted with opportunities?.....
-
- 4. Discharge:
- 1) By whom?..... 2) Chief causes?.....
-
- 3) System of appeal and investigation.....
- 5. Discipline:
- 1) By whom?.....
- 2) Causes: Non-attendance.....tardiness.....stop work early.....
- other (specify).....
- 3) Method: fines.....
- do they go to benefit of management?.....men?.....
- other methods.....
- 4) System of appeal and investigation.....
-

IV. SERVICES

1. Food:

- 1) Lunchroom: for office.....for shop.....for both.....
- 2) Other facilities: for office.....for shop.....for both.....
- 3) Kind of food: hot.....cold.....
- beverages: hot.....cold.....
- well prepared.....variation.....
- 4) Length of lunch period.....
- 5) Surroundings: Comfortable.....clean.....attractive.....
- temperature.....light.....ventilation.....
- quiet.....smoking.....

2. Health:

- 1) Benefit: Paid in full.....paid in part.....
by whom paid?.....
- 2) Medical clinic: a) Doctor: Visiting.....Plant.....
b) Nurse: visiting.....Plant.....
c) Hospital arrangements: plant.....Outside hospital.....
e) Examinations.....
- 3) Dental clinic.....if none, dental care.....
- 4) Eye clinic.....if none, eye care.....
- 5) Rest Room: 1) Entire plant.....for men.....for women.....
b) Each department.....for men.....for women.....
c) Equipment.....
d) Surrounding conditions: Noise.....
Temperature.....light.....
e) Number accommodated at one time.....
f) Supervision.....
- 6) Dressing rooms: Plant.....Department.....
Lockers.....Books.....
- 7) Lavatories: Plant.....Department.....
Adequacy.....Conditions: good.....fair.....poor.....

3. Recreation:

- 1) Room (describe).....
a) Time used.....b) Supervision.....
- 2) Clubs (name).....
- 3) Athletic fields.....
- 4) Library: Branch.....Private.....Librarian.....
When available.....
- 5) Other.....

V. PENSIONS, BENEFITS AND INSURANCE

1. Unemployment fund: Union.....Employees' insurance.....
Employers' fund.....Partnership: Type.....
2. Financial rewards.....Partnership: Type.....
3. Pensions.....
4. Insurance: type.....
5. Accident Compensation.....
6. Bonus for length of service.....
7. Vacation with pay: Number of weeks.....Requirements.....
8. Railroad passes.....
9. Discount on products.....
10. Coöperative buying.....
11. Building and loan.....
12. Vacation without pay.....
13. Other non-financial rewards.....
14. Banking and saving facilities.....

VI. INDUSTRIAL RELATIONS: UNIONIZATION, SHOP REPRESENTATION

1. Type of shop: open.....closed union.....closed non-union.....
preferential.....company union.....
industry generally unorganized.....
2. Employee representation: Form.....
Representation.....
Function.....

3. Trade agreement: Subjects covered.....
Duration.....Administration.....
4. Grievances: To whom taken.....
How adjusted.....
5. Method of suggestions for employees.....
6. Attitude of management toward employees.....
7. Attitude of employees towards management as tested out.....
8. Yearly turnover:
 - 1) Per cent new employees, including temporary employees.....
 - 2) Average number on payroll.....
 - 3) Attendance: good.....fair.....poor.....
 - 4) Quality of workmanship.....
 - 5) Per cent discharge.....per cent voluntary leaving.....
per cent layoff.....per cent absenteeism.....
 - 6) Number employed last year (including temporary or part time employees,
unless otherwise stated).....Number resigned.....
Per cent of turnover.....
 - 7) Basis of computation.....

E. PROCESSES

I. MAJOR PROCESSES

1. List: shops and departments.....
2. Attach chart if available.....

II. SELECTED PROCESSES

1. Nature of work: (check)

- 1) Type of work: Hand operation.....Machine operation...automatic.....
semi-automatic.....quick.....slow.....coarse.....fine.....exacting.....
non-exacting.....clean.....dirty.....dusty.....oily.....hot to touch.....
normal temperature to touch.....noisy.....quiet.....
accident risk: safe.....little danger.....dangerous.....
health risk: industrial poisons.....
steady.....irregular.....periodic.....
- 2) Variation of work: Hand.....machine.....Set up.....Operation.....
Type of part worked.....Size of part worked.....
Materials used.....Size of order.....
Number of operations one job.....Number set ups one job.....
Relative times required: set up.....operation.....
Relative skill required: set up.....operation.....
- 3) Analysis of skill:
Technical knowledge: mechanical laws.....machinist principles.....
Specific machine: operation.....set up.....repair.....
Materials worked: strength.....speeds.....feeds.....lubricants.....
Blue prints.....Measuring instruments: micrometer.....caliper.....
gauge.....scale.....vernior.....
Tools: use.....care.....repair.....
Manual dexterity: accuracy.....speed.....motion saving.....
finger manipulation.....
Personality characteristics: initiative.....responsibility.....

- judgment.....dependability.....plan.....
 Sensitivity: ear.....eye.....touch.....
 Emotional stability.....
- 4) Job specification as made by plant. (Attach copy)
2. Changes in processes: (Check)
- 1) Increased automatic features..... 2) Combination operations.....
 3) Increase quantity output.... 4) Quality of produce: increase..decrease..
 5) Effect on skill needed of worker (mark increase x , decrease, o)
- Technical knowledge needed:
 Mechanical process.....machine.....materials.....tools.....
 Manual dexterity:
 Finger manipulation.....accuracy.....motion saving...speed.....
 Sensitivity: ear.....eye.....touch.....
 Personality characteristics:
 Initiative.....responsibility.....judgment.....plan.....
 dependability.....emotional stability.....
- 6) Effect on type of work: (mark in crease x , decrease, o)
 Hand.....machine.....automatic.....
 Quickness...exactingness...cleanliness...oiliness.....
 heat in handling.....
- 7) Effect on tendency to fatigue: (mark increase x ; decrease, o).....
3. Make Process Chart of Operation, or if this is impossible, list in proper sequence detail elements of operation.

APPENDIX B

WORKER'S SCHEDULE

Name.....Department.....Machine.....

A. FACTUAL INFORMATION

I. THE JOB

1. Conditions of Job: (Answer by check)

- 1) Space: too much.....normal.....crowded.....
 2) Work place: orderly...disorderly...crowded with details.....
 3) Equipment; supply: adequate.....inadequate...upkeep: good...poor...
 4) Tools; supply: adequate...inadequate...upkeep: good.....poor...
 5) Heat: warm...normal...cold... 6) Ventilation: adequate...inadequate..
 7) Light; of room: good..fair..bad.. 8) of work place: good..fair..bad..
 Answer Y (yes) or N (no):
 9) Agreeability: clean.....dirty.....dusty.....sooty.....smoky.....
 10) Type of floor: concrete...wood...wood platform,..Repair: good..bad..
 11) Vibration: of work place.....of floor.....of building.....
 12) Noise: work place.....building.....
 13) Posture of operator: stands.....sits.....type of seat (describe).....
 14) Respite in work: provided...possible...when taken...state how long...
 15) Chart of work place and surroundings attached.

2. Typical Operation:

- 1) Process chart attached (one or more as needed)
 2) Job specification attached

3. Elements of skill operator uses: See rating schedule B, II, 2.

4. Wage: Basis rate.....Bonus on operation.....
 Allowance set up.....Total weekly earnings (average of 1 mo.).....
 Total earnings 1927.....

5. Hours of work: Average day.....average week.....approximate weeks worked 1927.....
6. Night work: Regular.....occasional.....(maximum) hours night work one week.....

II. TRADE HISTORY OF WORKER

1. Experience this plant:
 - 1) Length service with plant (years and months).....
Jobs held and length of time of each.....
.....
 - 2) Special skills developed (general terms).....
.....
2. Working experience:
 - 1) Previous major jobs, plant, type of work, length of time held (in years and months).....
.....
.....
.....
 - 2) Reasons for leaving previous jobs (enumerate).....
.....
 - 3) Special skills developed (general terms).....
.....
3. Trade Training, if any:
 - 1) Type: Apprenticeship..... Upgrade..... Vestibule..... Other.....
 - 2) Where received.....
 - 3) When taken.....
 - 4) How long taken.....
 - 5) What specialized on.....
 - 6) Skill developed (general terms).....

III. SOCIAL BACKGROUND

1. Individual:

Name.....	Sex.....	Date of birth.....
Married.....	Number of children.....	Age of youngest.....
Age of oldest.....	Nativity: self.....	
father.....	mother.....	Race (W. C. O.).....
Religion (C. P. J.).....	School (public, parochial).....	
Age, grade completed.....	Date left.....	
Reason left.....	Attitude toward.....	
Other education.....		
2. Home:

Address.....	Number of stories.....
House: type.....	Families.....
Rooms.....	Condition of repair.....
Individuals.....	Depth back yard.....
Width side yard.....	Alleys.....
Condition yard.....	Condition.....
Street: width.....	
Distance from factory.....	
Time required daily.....	

3. Leisure Time Activities:

- 1) Recreation: Approximate weekly time used.....
 - Is operator interested in walking... football... baseball... tennis.....
 - golf... swimming... hunting... fishing... motoring... basket ball...
 - volley ball... pool... bowling... billiards... boxing... wrestling.....
 - moving pictures... theater... vaudeville... musical comedy.....
 - music... concerts... opera... radio... gardening.....
 - reading: newspapers... magazines... books.....
- 2) Community activities: Approximate weekly time used.....
 - Clubs... Fraternities.....
 - Church... Union.....
 - Politics... Other.....
- 3) Night school: list classes attended, length of time each.....

B. CHARACTERISTICS OF WORKER

I. CHARACTERISTICS ON PRESENT JOB

1. Habits of Work:

- 1) Orderliness:
 - a) Arrangement of tools and materials: good... ave... poor...
 - b) Personal appearance: neat... average... slovenly.....
 - c) Care of his tool cabinets, locker, etc.: orderly.....
 - average... disorderly.....
- 2) System:
 - a) Arrangement of plan of work: good... average... poor.....
 - b) Steadiness at work during day: poor... average... good.....
 - c) Regularity of motions on standard job: little... ave... great...
- 3) Habit of plan?
 - a) To make and maintain own program of work, set up: good.....
 - average... poor...; operation: good... average... poor.....
 - b) To save motions: good... ave... poor... c) other.....
- 4) Regularity:
 - a) In attendance: good... average... poor.....
 - b) In promptness: always... usually... has to be checked up....
 - c) In staying at work till closing time: always... usually.....
 - stops work early.....

2. Elements of skill which operator shows:

- 1) Technical knowledge:
 - a) Of machine principles: good... average... poor.....
 - mechanical drawing: average... good... poor.....
 - mathematics: good... ave... poor...; Machine work: poor... ave... good... care and operation machine, tools: good... ave... poor... blue print reading: good... average... poor.....
 - trade theory.....
 - b) Of specific machine: operation: good... ave... poor.....
 - set up: ave... good... poor...; repair: poor... good... ave... adjustment to new uses: good... average... poor.....
 - c) Of materials used: strength: good... average... poor.....
 - speeds: good... ave... poor...; feeds: poor... good... ave... Use of lubricants: average... good... poor.....
 - d) Of measuring instruments: micrometer: accurate... inaccurate... caliper: accurate... inaccurate...; vernier: accurate.....

- inaccurate..... gauge: accurate..... inaccurate.....
 scale: accurate..... inaccurate.....
 e) Of calculating instrument; slided rule: good....ave....poor.....
- 2) Manual dexterity:
 a) Accuracy of movement: good.....average.....poor.....
 b) Speed of movement: poor.....good.....average.....
 c) Motion saving: Does naturally.....indifferent.... fails to do....
 d) Finger manipulation: dexterous.....average.....clumsy.....
- 3) Sensitivity; Eye: good.....average.....poor.....
 b) Ear: good...average...poor... c) touch: good...ave....poor....
- 4) Development of automatic reaction:
 a) Through rhythm: noticeable.....average.....little.....
 b) Other.....
- 5) Personality characteristics:
 a) Initiative: considerable.....average.....little.....
 b) Responsibility: much.....average.....little.....
 c) Judgement: little...ave...above ave...; d) Dependability: good...
 average...little...; e) Plan: materials: good...ave....poor....
 tools: good...ave....poor...; order of work: good...ave...poor...
 f) Inventiveness: methods of work: good...ave....poor...; tools:
 good....ave....poor...; machine: good...ave....poor....
- 6) Production standing:
 a) Is it above average.....average.....below ave.....
 b) Give reasons for exceptions from average.....
3. Adjustment to unusual in work:
 1) Rush work: high...ave...low...; 2) overtime work: high...ave.....
 low... 3) Unfamiliar job: high...ave....low...; 4) New Processes:
 high...ave...low...; 5) Delays: high...ave....low...; 6) Rejected
 Work: high...ave....low...; 7) Night work: high...ave.... low....
 8) Other.....
4. Attitude toward work:
 1) Regular operation: likes.....indifferent.....dislikes.....
 2) Regular set ups: likes.....indifferent.....dislikes.....
 3) Variation in either: likes.....indifferent.....dislikes.....
 4) Confidence in ability to handle work: high.....average.....low.....
 5) Sense of security of employment: high.....average.....low.....
 6) Satisfaction in work from: (check apparent sources of satisfaction
 a) Job: much...some...none...; b) Wages: much...some...none...
 c) Conditions of work:
 (1) Physical surroundings: much.....some.....none.....
 (2) Social surroundings: much.....some.....none.....
 d) Other (specify).....

II. RELATIONS TO INDUSTRIAL ENVIRONMENT

1. To Management:

- 1) Openness to suggestion: good.....average.....poor.....
 2) Acceptance of criticism: good.....average.....poor.....
 3) Readiness to cooperate: good.....average.....poor.....

2. To other employees:

- 1) Sociability: a) Tendency to talk during working hours: great.....
 average.....small.....

- b) Tendency to talk after or between working hours: great.....ave.....small.....
 average.....small.....
 2) Readiness to share work if shortage: great.....ave.....low.....
 3) Responsibility for doing his share of work: great.....ave.....small.....
 4) Adjustment to new associates: easy.....ave.....difficult.....
 3. Use of Industrial Facilities: (answer *Y* (yes) or *N* (no))
 1) Recreation..... 2) Health.....
 3) Lunch room..... 4) Benefit societies, cōoperative
 and so forth.....

III. FURTHER COMMENT

.....

C. STUDENT'S RATING OF WORKER'S SATISFACTIONS AND DISSATISFACTIONS

If the following are active elements in worker's attitude toward his job, mark *s* if he likes, *d* if dislikes. If not active elements, cross out.

I. SATISFACTION ON JOB

1. Physical: 1) Change of posture..... 2) Activity.....
 3) Rythm..... 4) Ease in meeting demands.....
 5) Other (name).....
 2. Mental:
 1) Use of his capacities..... 2) Stimulus to learning.....
 3) Stimulus to invention..... 4) No unreasonable demands.....
 5) Opportunity for thought..... for sociability.....
 3. Emotional:
 1) Quantity product..... 2) Quality product.....
 3) Beauty of product..... 4) Feeling of ownership.....
 5) Competition..... 6) Sense of usefulness.....
 7) Exercise of power: over things.....over people.....
 8) Sense of prestige: in job.....in product.....in plant.....
 9) Other.....

II. SATISFACTION IN WAGES

1. Physical:
 1) Ability to meet needs: necessities.....luxuries.....
 2) Opportunity for raising standard of living: for self.....
 for children.....
 2. Mental: Opportunity for "advancement" (not physical) for self.....
 for children.....
 3. Emotional: 1) Sense of successful rivalry.....
 2) Sense of success in relation to social scale.....
 3) Other.....

III. SATISFACTIONS IN CONDITIONS OF WORK

1. Physical:
 1) Industrial condition in plant: space.....air.....light.....order.....
 cleanliness.....health facilities.....safety.....recreational facilities.....
 2) General appearance of plant.....
 2. Mental:
 1) Security of job..... 2) Opportunity for promotion.....

3. Emotional:

- 1) Relations with foreman..... 2) Relation with general management..... 3) Relations with fellow employees: sociability..... friendship..... common activities: on job..... off job.....

IV. GENERAL QUESTIONS ON SATISFACTIONS

1. Is present job as satisfying as previous jobs?..... if not, why not?.....
 Does it use all skills and capacities developed?.....
 Does it leave some undeveloped which individual could name?.....
 Does individual contemplate remaining at it?.....
 2. If given choice, what would he do aside from earning more money?.....
 3. Further comment by student.....

APPENDIX C

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(To be concluded in the August number)

A Time Questionnaire Study

BY MARIE G. ANDREWS, *North Carolina College for Women*

This study of distribution of students' time in a women's college was made in 1925-1926 and in 1927-1928, by a Student Counselor in the North Carolina College for Women at Greensboro.

Over 700 students at the North Carolina College for Women voluntarily kept a record of the use of their time for a week. On a questionnaire they recorded the time they spent in 5 curricular activities, in 12 extra-curricular, in 3 health, in 1 or more remunerative, and in 3 miscellaneous activities. Statistics have been gathered from the data obtained to show the distribution of time spent by the students in these various activities.

A study of the data reveals a constant decrease in the number of hours spent by the freshman, sophomore, junior, and senior classes in curricular activities. The medians for the four classes are: freshmen, 42.7 hours; sophomores, 41; juniors, 39.8; and seniors, 36.1. A study of the data reveals an increase, not absolutely constant, however, from the freshman to the senior class in the number of hours spent in extra-curricular activities. The medians are: freshmen, 26.6 hours; sophomores, 30.1; juniors, 29.5; and seniors, 34.2 hours.

IN THE belief, that, if one can learn the actual use which students make of their time, one can discover the roots of some of the problems which beset a college; and that, if individual students record the actual use which they make of their time for a definite period, they can be helped in the problem of the proper budgeting of time, this time questionnaire study has been made.

The questionnaire used in this study was formulated by a committee of faculty members and students. It was presented to student groups in dormitory house meetings. At this time particular emphasis was laid upon the purpose of the questionnaire, a special point being made of the fact

that the purpose was not that faculty members might make a check on the use which any student made of her time, but that there might be revealed to her through this the actual use she was making of it. That the study might be as accurate as possible, only interested students were asked to keep the questionnaire. This plan was used in 1926, and again in 1928 when the study was continued.

The week in 1926 which was chosen for this work proved to be a rather unfortunate time inasmuch as on one day of that week no regular academic activities were held because of the death of one of the charter faculty members. For that reason, in order to make a comparative study of the

THE NORTH CAROLINA COLLEGE FOR WOMEN
TIME QUESTIONNAIRE

Name.....Class.....Dormitory.....Date.....

	NUMBER OF HOURS SPENT							
	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
1. CURRICULAR ACTIVITIES:								
Academic Preparation.....								
Laboratory.....								
Class Room.....								
Conference.....								
Chapel.....								
2. EXTRA-CURRICULAR ACTIVITIES:								
Student Government.....								
Y. W. C. A.....								
Class Work.....								
Societies.....								
Departmental Clubs.....								
Dramatics.....								
Church.....								
Entertainments and Social Activities.....								
Unassigned Reading.....								
Talking and Visiting.....								
Athletics and other Physical Recreation.....								
Publications.....								
3. HEALTH:								
Sleep.....								
Meals.....								
Personal Habits.....								
4. REMUNERATIVE WORK.....								
5. MISCELLANEOUS WORK:								
Correspondence.....								
Shopping.....								
Care of Room.....								
TOTAL.....								
Unaccounted for.....								

FIG. 1. THE TIME QUESTIONNAIRE FORM

two years, the week in 1928 which was chosen had five rather than six class days.

The questionnaire (see figure 1) is divided into five main divisions: curricular activities, extra-curricular activities, health activities, remunerative work, and miscellaneous work. The attempt was made to include in the first group of activities the work required in the academic program. The word, conferences, as used in this division refers only to conferences for work of an academic nature. Since, at the North Carolina College for

time spent in the Y. W. C. A., a student recorded the time spent in Vesper services, in Y. W. C. A. Cabinet meetings, and in all other Y. W. C. A. meetings and activities. At the North Carolina College for Women every student belongs to one of four societies. Inasmuch as these play a considerable part in the social life of the campus, it was deemed advisable to have in this division a special place for a record of time spent in work for them. Time spent in entertainments and social activities including such activities as picture shows, dormitory house par-

TABLE 1
Hours spent in four activities

CLASS	CURRICULAR			EXTRA-CURRICULAR			HEALTH			MISCELLANEOUS		
	Q ₃	M	Q ₁	Q ₃	M	Q ₁	Q ₃	M	Q ₁	Q ₃	M	Q ₁
Freshmen.....	36.8	42.7	49.4	22.0	26.6	32.9	74.4	78.4	81.9	6.0	8.5	11.2
Sophomores.....	35.2	41.0	46.4	23.9	30.1	36.5	75.4	79.3	83.9	5.6	8.2	11.6
Juniors.....	34.8	39.8	44.6	23.8	29.5	36.6	77.6	81.3	85.1	5.5	8.1	11.0
Seniors.....	30.2	36.1	42.8	26.9	34.2	40.7	69.1	75.8	80.6	6.2	8.7	11.6

Q₃—third quartile; M—median; Q₁—first quartile.

Women, attendance at chapel is required, a place was provided here for a record of time spent in this activity. The second group, that of extra-curricular activities, consists, for the most part, of student campus activities. That all the subjects in this division may be clear, a word of explanation concerning some is given. For time spent in student government work, a student recorded time spent in such activities as senate meetings, dormitory meetings, dormitory committee meetings, conferences with faculty members for dormitory problems, and conferences with individual girls for student government problems. For

ties, college parties, concerts, and teas was recorded. Because a number of hours in every week of a student's life is spent in talking and visiting, a special place was made in the questionnaire for this particular record. The term "athletics and other physical recreation" refers to physical exercise and recreation which is not required, but which forms a part of the extra-curricular program. The third and fourth divisions are self explanatory. Some space was left in the fifth division, termed miscellaneous, for time spent in activities not listed.

There are several points of which one should be mindful in studying data

compiled from such a questionnaire. Since the study covered but one week, the figures must not be used to indicate conclusive evidence about the number of students participating in or the amount of time spent in the work of any organization. It is possible that some students may have filled out their questionnaires according to their idea of the use which it was expected that they make of their own time rather than of the actual use which they made. Finally, inaccuracies of a general nature probably occurred in places.

because of the probable three scheduled on the day on which there were no classes), two hours for preparation for every unit of work, and two hours for chapel and conferences for academic work.

	hours
Class room.....	13
Academic preparation.....	26
Conferences and chapel.....	2
Total.....	41

In the distribution of data the classification nearest to 41 was that with the number 40.

In table 2 a total of 72 hours was

TABLE 2

Per cents of students who returned questionnaire who spent definite amounts of time in four activities

CLASS	CURRICULAR		EXTRA-CURRICULAR		HEALTH		MISCELLANEOUS
	Less than 40 hours	55 or more hours	Less than 20 hours	30 or more hours	Less than 72 hours	84 or more hours	12 or more hours
	per cent	per cent	per cent	per cent	per cent	per cent	per cent
Freshmen.....	39.5	6.5	16.0	13.5	14.0	14.5	17.5
Sophomores.....	43.5	5.5	9.5	27.0	11.5	25.5	20.0
Juniors.....	49.5	3.5	10.5	25.0	3.5	30.5	16.5
Seniors.....	66.0	3.5	11.0	42.0	30.5	14.0	20.5

The total number of questionnaires returned in 1926 is 508; in 1928, 225. These are distributed among the classes as follows:

	1926	1928	Total
Freshmen.....	212	68	280
Sophomores.....	120	51	171
Juniors.....	118	58	176
Seniors.....	58	48	106

In table 2 a total of 40 hours was used as a standard of comparison for curricular activities. This standard was found by considering 13 hours for class room work (three hours having been deducted from the average 16

used as a standard of comparison for health activities. This standard was found by considering 8 hours for sleep for 7 nights, one-half hour for each of three meals for seven days, and one hour a day for seven days for personal habits.

	hours
Sleep.....	56
Meals.....	10.5
Personal habits.....	7
Total.....	73.5

In the distribution of data the classification nearest to 73.5 was with the number 72.

An examination of the data reveals that 71 students spent from 0 to 24 hours in work for remuneration, the median being 4.2 hours.

118 students spent from 0 to 15 hours in student government work. The medians for the four classes are: freshmen, 1.5 hours; sophomores, 1.8; juniors, 2.1; seniors, 3.

104 students spent from 0 to 7 hours in Y. W. C. A. work. The medians for the four classes are: freshmen, .9 hours; sophomores, 1.1; juniors, 1.5; seniors, 1.3.

227 students spent from 0 to 8 hours in work for the freshman, sophomore, junior, and senior classes. The medians for the four classes are: freshmen, 1.2 hours; sophomores, 2.1; juniors, 1.5; seniors, .9.

38 students spent from 0 to 38 hours on college publications. The median for this work is 2.3 hours.

124 students spent from 0 to 11 hours in work for departmental clubs. The medians for the four classes are: freshmen, 1 hour; sophomores, 1.8; juniors, 1.7; seniors, 1.7.

561 students spent from 0 to 10 hours in church activities. The medians for the four classes are: freshmen, 2.7 hours; sophomores, 2.4; juniors, 2.7; seniors, 2.5.

510 students spent from 0 to 22 hours in entertainments and social activities. The medians for the four

classes are: freshmen, 3.6 hours; sophomores, 4.3; juniors, 4.8; seniors, 4.6.

682 students spent from 0 to 28 hours in unassigned reading. The medians for the four classes are: freshmen, 4.9 hours; sophomores, 5.9; juniors, 5.9; seniors, 6.6.

733 students spent from 0 to 40 hours in talking and visiting. The medians for the four classes are: freshmen, 13.1 hours; sophomores, 11.5; juniors, 10.9; seniors, 11.4.

659 students spent from 0 to 16 hours in non-prescribed athletics and other physical recreation. The medians for the four classes are: freshmen, 3.5 hours; sophomores, 5.1; juniors, 4.3; seniors, 5.1.

The possibilities for studies in a project of this sort are by no means exhausted here. They are limitless. While such a project may have some value in that it is a revelation to the one who examines it of the use which college students make of their time, it is believed that the greater value has come to the individual girls who filled out the questionnaire, and thus had revealed to them the actual use they were making of their time. It is hoped that this questionnaire has assisted them somewhat in the expedient distribution of their day, and that, as a result, time has a new value to them.

Manuscript received February 23, 1929

An Aid to the Selection of Pressman Apprentices

BY O. MILTON HALL, *Personnel Research Federation*

This investigation of the performance of pressman's apprentices in the Minnesota Paper Form Board Test grew out of the studies reported by Dr. Don H. Taylor in the PERSONNEL JOURNAL for June, 1929. The value of incorporating such a test in a battery of selective aids is shown.

Ratings of skill of 89 job and cylinder pressman's apprentices are compared with the scores of these men on the Minnesota Paper Form Board test, Series A and B. The reliability of each Series is $.90 \pm .01$. A definite positive relationship between test scores and judged trade ability is shown. The coefficient of correlation is $.58 \pm 1.047$. Seventy per cent of the inferior workers stand below a critical score set at 45, while only 6 per cent of the workers of average skill, and 5 per cent of those of superior skill fall below that score. It is concluded, therefore, that this test may be used as one tool to aid in the selection of pressman apprentices.

THIS paper is an account of the relationship discovered between success in the Minnesota Paper Form Board test and judged aptitude for the work of pressmen. It reports a small part of preliminary findings in a three year investigation of psychological tests as tools for apprentice selection in the printing industry of New York City. The study, financed coöperatively by the employers, unions and the National Junior Personnel Service, Inc., is being made under the supervision of Don H. Taylor, Assistant Director of the latter organization and Assistant Director of Industrial Relations, New York Employing Printers' Association. Its purpose is to discover objective meas-

ures which might be used by the apprentice schools to at least guide away from the various printing trades such young men as are obviously unsuited for the work. During the first year of experimentation, a number of standard group tests were given to apprentices in several branches of the printing trades.

The pressman's work may be best described by quoting a pertinent portion of the preliminary job-analysis:

The pressman makes ready the press and does the actual job of printing. He may be assisted in this work by one or more workers called pressman assistants, but is directly responsible for the quality and quantity of the work which comes from the press or presses he has in charge.

In making ready the press he locks the

form containing the composed matter in the proper position on the paper, and makes the many adjustments that are necessary, such as ink supply and distributing mechanisms, automatic feeders, etc. Many of these adjustments are so fine that they are often affected by atmospheric conditions and

ally specialize in that type of work produced by one or more of the many special machines that make up the equipment of the modern pressroom. They are known by the type of machine they operate. Thus we have job pressman, cylinder pressmen, web pressmen, etc.

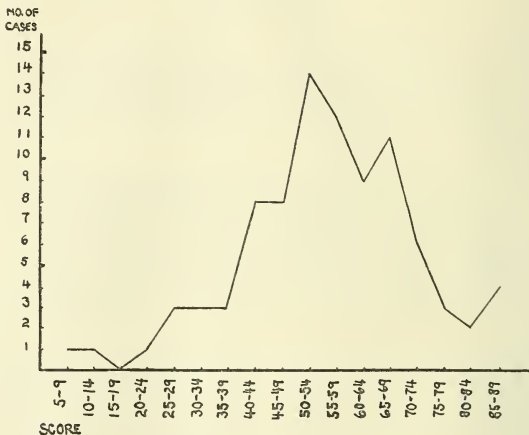


FIG. 1. DISTRIBUTION OF 89 TEST SCORES

room temperatures. One of the most important and delicate operations involved in "make-ready" is concerned with making sure that all portions of the job are printing uniformly. This entails careful observation, noting of spots not printing properly and the careful cutting out of paper shapes to be placed under the paper at precisely the points where contact with the form (type, etc.) is not sufficient to bring out detail. The pressman must be constantly alert to detect any variations in the quality of the work. Much work is done with colors.

Pressman and pressman's assistants usu-

The subjects were attending the School for Printing Pressmen, according to union ruling which requires that each apprentice must attend the school six hours per week during the four years of apprenticeship. They were distributed according to Year as follows:

First year	23
Second year	27
Third year	23
Fourth year	16

The average age of the group was thirty years, while the average number of years in the trade was thirteen. Here, then, was a group of mature printers from representative shops throughout the City of New York,

Scores on
Form Board
Test

	INFERIOR SKILL N = 23	AVERAGE SKILL N = 47	SUPERIOR SKILL N = 19
5-9	●		
10-14	●		
15-19			
20-24	●		
25-29	●●	●	
30-34	●●		0
35-39	●●●		
40-44	●●●●●●	●●	
45-49	●●	●●●●●●	
50-54	●●●	●●●●●●●●●●	0
55-59		●●●●●●●●	0000
60-64	●	●●●●●●	00
65-69		●●●●●●	00000
70-74	●	●●●	00
75-79		●●	0
80-84		●●	
85-89		●	000

FIG. 2. SHOWING POSITIVE RELATIONSHIP BETWEEN TEST SCORES AND SKILL

of years in the trade was thirteen. Here, then, was a group of mature printers brought together in an unusual laboratory situation.

Eighty-nine job and cylinder pressmen's apprentices took both the A and B Series of the Minnesota Paper Form

scores. As to reliability of the test, the coefficient of correlation between the two Series was $.90 \pm .01$.

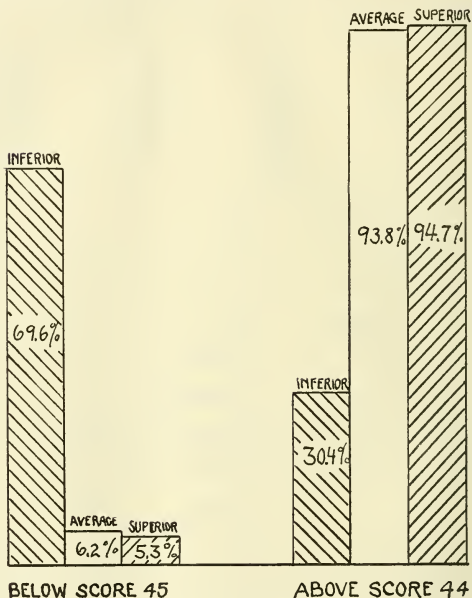


FIG. 3. PERCENTAGES OF GRADES OF CRAFTSMANSHIP FALLING ABOVE AND BELOW CRITICAL SCORE ON TEST

Board test. They were tested by Dr. Taylor and the writer during March, 1929, an interval of two weeks separating administration of the two forms. Figure 1 shows the distribution of test

It was of course necessary to obtain some criterion of ability in the trade. Investigations of this sort are usually hampered at this point—and the present one was no exception. Reliance

had to be placed upon ratings of skill by the three instructors. Accordingly a five-point scale was drawn up, ranging from Poor to Exceptional, and ratings on the relative skill of members of the group of *similar experience* were obtained from the instructors. Terms were clearly and concretely defined, and every effort was made to insure maximum reliability. Judgments were of course made independently, but as the instructors worked in close contact there is no way of knowing to what degree they influenced one another's opinions previous to rating.

For statistical purposes numerical values were attached to the five grades and averaged to arrive at the criterion score. No case was used where there was wide divergence on the part of the raters, that is, when one judged a man to be below the average and another above.

The ratings were distributed as follows:

Exceptional.....	3
Superior.....	16
Average.....	47
Fair.....	21
Poor.....	2

Correlating this with achievement on the Paper Form Board test, A and B Series, the product-moment method yielded a positive coefficient of .58 with a Probable Error of $\pm .047$.

For graphical analysis the grades of ability or skill are reduced to three: Inferior, Average, and Superior. Figure 2 shows clearly the positive relationship between achievement on the

test and judged skill on the job. It is in the form of a scatter-diagram. Along the abscissa are distributed the workers according to the test score, while they are further divided by the three sections into the grades of skill; inferior, average, and superior craftsmen. If a critical score is set at forty-five, 69.6 per cent or 16 of the 23 inferior workers are eliminated, while 93.8 per cent of the average and 94.7 per cent of the superior workers are retained. These percentages are represented graphically in figure 3, where the three grades of craftsmanship are divided into two groups, those falling below the critical score of 45 on the test, and those reaching or exceeding that score. The test is clearly useful as one means of detecting aptitude for the job of printing pressman.

Wide differences between the average scores obtained by the three groups is further evidence of the discriminatory value of this tool. The average scores are:

Inferior Skill group.....	39.89
Average Skill group.....	59.31
Superior Skill group.....	66.45

The Minnesota Paper Form Board test, Series A and B promises to be, therefore, a valuable aid to detecting aptitude for the job of printing pressman. Its use for this purpose at the present time is not advocated; much work is yet to be done in discovering further objective measures to accompany and reinforce this one. But its valuable possibilities are demonstrated.

Manuscript received December 1, 1929

Growth of an Employee Relations Research Study

By G. A. PENNOCK AND M. L. PUTNAM, *Western Electric Company*

The intimate working relations of employees, supervisors and management can be improved in the common interest as they become better understood. To this end, three articles by Messrs. Pennock, Putnam and Mayo in the February PERSONNEL JOURNAL have drawn the attention of many executives. The story of how these studies in the Hawthorne Works of the Western Electric Company began and of how they evolved, is told in the following pages. One question led to another, until an effort to determine precise relations between illumination and output had brought the management face to face with highly significant facts about mental attitudes as related to a wide circle of conditions, personal as well as material, outside as well as inside the factory walls.

IT HAS been characteristic of many quests for knowledge to open up new fields of further experimentation quite different from the original objective. This has been true of the present studies in employee relations being conducted at the Hawthorne Works of the Western Electric Company. The accompanying chart depicts the development of these studies and shows their scope after six years' growth. In the following brief description the figures in parenthesis refer to divisions in the chart.

Beginning in 1924 with a study of illumination (1) to determine the effect of the intensity of light on production (2), the story is one of unexpected findings and an enlarging area of study. Although the illumination study failed to reveal adequate answers to the ques-

tions asked, it served to show that studies in human relations could not be conducted by the "single variable technique" that is commonly used in the more exact sciences, and that some method must be used which allows for the simultaneous study of all variables.

These thoughts led to the first by-product (3), which was the realization that all of the factors in the effectiveness of employees should be studied, and that the study should be made by what has been called a "multiple free variable" method. It was therefore decided to establish a test room (4) where as many as possible of the human variables entering into the work situation could be simultaneously observed and where single variables in conditions could be introduced. In the test room were five women oper-

ators engaged in repetitive assembly work. There were also devices for recording their productivity and variation in work. The original objective (5) was to find the answers to six questions, namely:

- Do employees actually get tired out?
- Are rest pauses desirable?
- Is a shorter working day desirable?
- What is the attitude of employees toward their work and toward the Company?
- What is the effect of changing the type of working equipment?
- Why does production fall off in the afternoon?

In conducting the studies certain variables were introduced independently such as altered pay incentive, new supervision, rest periods, lunches, five-day week, and shorter working days. As a check on the effects of these variables, some of the changes were repeated from time to time.

The original list of six questions has grown and at present the objectives are in the form of problems which are called research study projects (6). Each of these projects contains questions for study.

The second by-product (7) arose directly from the conclusions and results of the test room experience. Perhaps the most amazing result was the steady increase in each individual's output ranging from thirty per cent to fifty per cent; the increase continuing regardless of the variable introduced, and accompanied by improved or maintained health, with decreased tardiness, sickness, and absence. After rather definitely evaluating the effect of rest pauses and changes in pay incentive it was concluded:

- (a) That the greatest factor in these results was an improved mental atti-

tude of the employees, brought about by better and more personal consideration in supervision, and by freer and more pleasant working conditions.

- (b) That the social, home, or outside life, of people is definitely related to their success or failure in their daily work.

These conclusions were based on evidence found in the employees' conversations which had been recorded. Their disclosures showed the need for further study of actual conditions in the regular departments with special emphasis on the employees' attitude toward them.

Thus an interviewing program (8) was established for the purpose of learning the employees' likes and dislikes toward the various elements in their working environment. With this information at hand, it was thought improvements could be instituted which might enable the Company to realize in some measure the results already noted in the test room experiments. At first each of approximately sixteen hundred employees was interviewed and the results were so satisfactory that plans were soon made for extending it to other groups until now it includes about twenty thousand people, all of non-supervisory rank.

Each employee is invited to contribute his comments, and all that he says is held strictly confidential. No identifying information is included in the written report of each interview.

A study of the interviews furnishes data bearing on three fields (9). Comments on working conditions furnish valuable ideas as to possible improvements in the physical working environment and are making desirable

the improvement of many items previously considered satisfactory.

Non-identifying comments of employees are discussed by supervisors in conference groups. Experience with this plan of training indicates that it

of direct accusation and argument. Approximately two thousand supervisors are now meeting bi-weekly to discuss employees' comments.

A combination of the comments of employees and the supervisory discus-

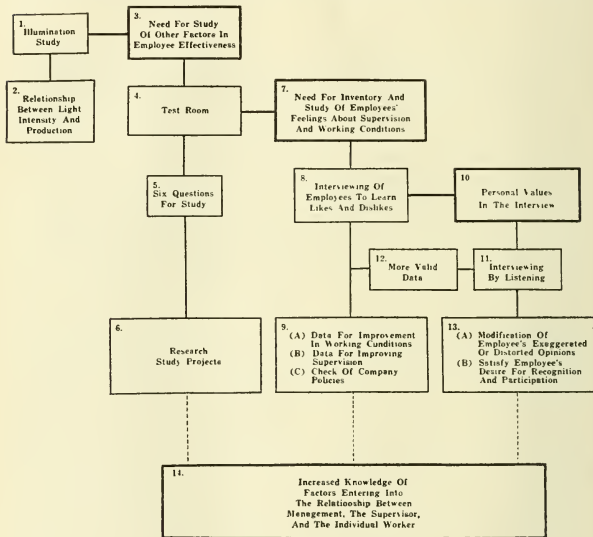


FIG. 1

has advantages not previously obtained by other training means. It gives the supervisor a mirror in which he may see himself as he is seen by employees and yields the values in the employee's point of view without the fruitless hard feelings which result from the method

sions are furnishing a new and valuable check of Company policies affecting employee relations.

The third by-product (10) is perhaps the most outstanding of all. It may be called the realization that the interviews, in providing a channel of

expression for employees without fear of consequences, benefit the employees themselves. It has led to an entirely new conception of the program and has been the basis for the development of the present method of interviewing which is a radical departure from methods previously used. As evidence of this beneficial effect, many comments have been received from employees which in substance are as follows: "Gee, I sure do feel better now that I have that off my chest."

With this knowledge it became clear that if a channel for free expression were to be provided, the interview must be a listening rather than a questioning process (11). The interview is now defined as a conversation in which the employee is encouraged to express himself freely upon any topic of his own choosing. No restrictions as to time or subjects are made. Employees are paid average earnings for the time consumed in the interview.

It is interesting to note that with the development of this type of interview, it became evident that the information gained was more valid than when the interviewers had suggested topics upon which the employees

should express themselves (12). It seemed a fair assumption that a spontaneous comment, arising without suggestion, was of more importance to the employee than one which followed a direct question from the interviewer.

These personal values are growing in importance as the program develops. It has been found that employees' opinions, in many instances, tend to become exaggerated and distorted probably because of continued thought on unpleasant subjects, and that these distortions become modified when freely expressed to a sympathetic and critical listener. Another element in this type of interview is that employees appreciate being recognized as individuals who have valuable comments to make, and enjoy the opportunity to offer their thoughts (13).

While the above brief view of the studies being conducted may seem to indicate that they are widely varied, they all have the same objective (14); namely, to increase the knowledge of factors entering into the complex human relationships found in the industrial order of to-day.

Manuscript received April 3, 1930

The German Industrial Inquiry

Some Findings with Reference to the Psychology of Labor¹

BY OTTO LIPMANN, *Berlin*

TRANSLATED BY MORRIS S. VITELES

The distinguished industrial psychologist, Dr. Otto Lipmann, has for three years co-directed the investigations of the Efficiency Committee of the German Industrial Inquiry Board. Readers of the Personnel Journal will recall his thoughtful paper on The Human Factor in Production, published in August, 1928.

The nature of the problems studied by the Industrial Inquiry Board is indicated, and findings with reference to two of the major problems are discussed by way of illustration. The reaction of the worker toward the introduction of machinery is found to be hostile, because work in the mechanized plants involves considerably more bodily strain and increased mental strain. Unwillingness to break fixed habits is a factor. The machine deprives workers of jobs. They do not fully profit from the increased production brought about by machines. The use of machinery in plant operation brings certain definite benefits to the workers, but these are not acknowledged as such by reason of his violent objections, at least at the beginning. The other major problem concerns changes in sickness and accident figures. Various obvious and subtle factors affecting the number of sickness and accident reports are presented and analyzed.

TWO techniques have been employed by the Efficiency Committee of the German Industrial Inquiry Board in seeking an answer to the question of the relationships between production and working hours and between production and wages. The first involves an analysis of plant statistics; the second, a direct interview of plant owners, plant man-

agers and workers. It follows that the findings are of two kinds, consisting in part of a large mass of statistical data and in part of conclusions growing out of the interviews. To some degree, of course, the findings are in the form of a combination of these two kinds of data, and that combination is the most important method, because purely statistical results have no value, if they are not supplemented by the report of persons who are working on the job; and such purely sta-

¹ Paper read before the Ninth International Congress of Psychology, New Haven, Conn., September 6, 1929.

tistical results can lead to absolutely wrong conclusions. The Committee has therefore given special attention to the method of interview and has published some of its interviews verbatim.

The investigating procedure employed in this work is a new and fruitful one. It has never yet been possible to gather such a wealth of statistical material concerning industrial plants, and to make comparisons among plants on so large a scale—a wealth of material which, however, is oriented not solely from the viewpoint of what appears to be of particular interest to one or another *plant*, but reflects in its organization the point of view of the *investigator*. Such data, the preparation of which involves a tremendous amount of work, can only be assembled by an investigator endowed with broad statutory privileges and to whom the plant under investigation is obliged by law to supply information.

At the same time the character of the investigating committee, made up of men of learning, of representatives of the various political parties and trade groups, naturally aided by those with expert knowledge of the industry under investigation, is a guarantee of the objectivity and impartiality of the data obtained in the course of the investigation.

The investigation was oriented not primarily as a psychological study, but as more broadly concerned with the science of labor. But inasmuch as in general, psychology plays a rôle alongside of physiology, hygiene, techniques of various sorts, trade education, etc. in the science of labor, the

findings may be described as not without value to industrial psychology.

Before presenting such results from this study as can be given in the time allowed, it may be well to indicate briefly the nature of the problems which came up for consideration. What is the effect upon the mental attitude of the worker, more particularly upon his will to work, of various wage systems; of various wage levels, in relation to the purchasing value of money; of payments in money or in kind? What is the reaction to deductions from his pay for insurance or other purposes? How does he react toward the introduction of machinery, toward scientific management, and towards the effects of these upon the labor market and the relationship between labor and production costs? What is the relationship between the intensity of the will to work and the frame of mind of the worker on one side and production in general, the relationship to the working organization and the attitude or disposition of the worker toward the plant and toward production on the other side? What are the effects of working conditions in one industry or trade, as compared with another related industry, upon the stability of the worker? In what way, for example, is the tendency to leave the country, to leave farm work, favored or counteracted by working conditions in industry as compared with working conditions on the farm? What is the effect of unemployment insurance upon the willingness or desire to work? How does the amount of sick benefits, in relation to pay, influence the tendency of the worker to report sick? Upon what

sort of circumstances depend the number of sickness and accident reports on the one hand, the number of accidents calling for compensation on the other hand, and the relationship between the two? Is the frequency of sickness and accidents a measure of the worker's efficiency? How do the aptitude and fatiguability of the worker influence his production? What is the influence of working and living conditions upon the way in which the worker spends his free time, and how does this, at times, reflect itself in production?

I can only refer briefly to the findings of the committee concerning a few of these problems. It may be well, however, to point out at once what appears to me to be the most significant of these findings. In no instance is it possible to conclude that any one of the working conditions which have been under investigation is to be singled out as "favorable" or "unfavorable" from the point of view of the frame of mind of the worker. The object of psychological investigation in industry must be that of determining under which *related* conditions the worker reacts in one or another manner to a wage system, to a threat of discharge, to payments in kind, etc. These related conditions are found, on the one hand, in co-incident external conditions and their particular configurations; on the other hand in the person of the worker.

I shall now consider briefly the findings with reference to one or two of the problems referred to above.

The first of these is the reaction of the worker toward the introduction of machinery.

OBJECTIONS TO MACHINERY

The period since 1913 has been marked by a tremendous increase in the use of machinery in the anthracite coal mines of Germany. Whereas in 1913, 95 per cent of the coal was mined by hand, through blasting, in 1926 the percentage of hand mined coal had been reduced to 33 per cent. Anthracite coal mining is a particularly suitable and interesting field for investigating the worker's attitude toward such mechanization. The report of the Efficiency Committee has the following to say in this connection.

In mining, the newly introduced machinery has been objected to with great feeling by the workers, at least the older workers, mostly on the ground that work in the mechanized plants involves considerably more *bodily* strain and also increased *mental* strain resulting from the noise and the greater claims upon attention.

However, it was found that this violent objection on the part of workers to machines did not lead them to give up using the machines when they had the choice of using the pick axe. As a matter of fact, it was often noticed that the workers thronged to the plants using the machines, and even objected when an attempt was made to deprive them of compressed air hammers. However, such facts must not be interpreted as meaning that the workers' objection was only "talk," and actually did not exist. For such a conclusion the reports of the workers are too general. There certainly remains a need for investigating the motives, in the mind of the worker, which lead to overcompensation for this violent objection.

One of the most important facts, which should be given first consideration, is the conservatism of the miner. It is by reason of this that the antagonism of the older pick man, who has not yet accustomed himself to the compressed air hammer, was greater than that of the younger man who had not worked long with the hand drill. So long as the worker is not familiar with the new working method he objects to it. He does not willingly work with the conveyor, but once he starts working with it he does not willingly leave it. One reason for this conservatism is the worker's unwillingness to be deprived of companionship.

Of further importance in the miner's, particularly the older miner's, steadfast opposition is the fact that the machine deprives workers of jobs. The worker receives no benefits from the introduction of machines, because he does not fully profit from the increased production resulting therefrom. It is true that the workers seek employment, perhaps even unwillingly, in the plants in which machines are used, because they can earn more in such plants than in others, but they feel that the increased pay does not correspond with the increased expenditure of effort and to the increase in production.

One possible reason for the worker's preference for plants in which conveyors are used, in spite of their objection of mechanization, is the superiority of the air supply in such plants.

Furthermore, certain of the workers do not show a preference for the

mechanized plants by reason of its machines, but by reason of a preference for the organization in the mechanized plant in comparison with the non-mechanized plant. The control in the non-mechanized plants is stricter. From every man a set quantity of coal is required, and the work is also more difficult because very close attention and considerable knowledge are required on the part of every man. In the mechanized plants, on the other hand, all that is required are regular work and a little knack which any worker can readily acquire.

In other instances the worker's objection to the plant with conveyors is based on the requirement in such plants that the worker perform a set task, whereas in the other plants, apart from the usual control, the worker feels fairly free at his work. So it is possible, in contradiction to what has been said before, that opposition to plants using machines may also reflect an opposition to the stricter organization in such plants.

In a certain sense the use of machinery in plant operation makes it easier for the worker at certain points. The introduction of the compressed air hammer has decreased the amount of blasting and the amount of fumes and danger associated with blasting. The use of the conveyor, as compared with the use of the coal shovel, decreased the amount of coal dust. The cutting machine makes it unnecessary for the worker to bore lying on his back. However, these benefits are not acknowledged as such by reason of the workers' violent objection to machines, at least at the beginning.

SICKNESS AND ACCIDENT FIGURES

Among the reasons for changes in sickness and accident figures the report distinguishes the following:

1. Changes in *health status* occasioned by:
 - a. Epidemic diseases
 - b. Changes in nutrition habits
 - c. Changes in living conditions
 - d. Changes in number of tasks to be done and the number of hours in the working day
 - e. Changes in the rate of work
 - f. Changes in technical training
 - g. Changes in the status of safety work
 - h. Changes in the classes of labor
2. Changes in the *incidence* of illnesses and accidents occasioned by:
 - a. The economic status of the worker and the level of sickness payment
 - b. The employment and control exercised over the Medical Office physicians

Following are a few comments on this topic from the report. At the time when the plant made less demand upon the man in the way of rate of work, a worker with a minor illness or injury could still meet the production requirements. However, although his condition remains the same, when greater demands in the way of intensity of work are made, he must report sick. During the inflation period, in general, work was pursued less actively, and the worker could still produce the required amount, even when suffering from minor illnesses.

Furthermore, if the wage rate is too low, a worker, anxious to earn a given amount, may be led to neglect paying sufficient attention to safety and underpinning, as a result of which there may be an increase in accidents caused by falling stones and coal.

When a mine is forced to employ a

great number of new workers, satisfactory standards of employment can not be adhered to. Men are hired who are generally not the most satisfactory and an increased accident and illness rate may ensue, as has been the case in certain of the plants.

Newly employed workers have about three times as many accidents, and twice as many cases of sickness as older employees. On the other hand, the duration of illness is longer and the effects of accident are more marked in the case of employees with the greater length of service.

The number of accidents and cases of illness as well as the number of days taken from work as a result of these, increases in direct proportion to the distance of the workers home from the mine shaft. This appears particularly in the case of newly employed workers.

During the inflation period of 1919 to 1923 the difference between the amount of wages and that of the sick benefit payment was very large, especially since health benefits were paid less frequently, that is, in fewer instalments than wages, so that at the time of payment the purchasing value of the health benefit had become considerably decreased. This resulted in marked hesitation in taking time off by reason of illness. Even those workers who were not quite well remained at work in preference to reporting sick. Because of this, during the inflation era, the figures for illnesses were low in spite of malnutrition.

The revision of the labor laws, which were put into effect in July 1926, brought closer payments during long illnesses, particularly in the case of married men with children. The higher

percentage of heads of families staying out by reason of illness, as compared with the figures for the plant as a whole, comes, in part, from the fact that the incentive toward taking time off because of illness increases in strength and the resistance against it decreases, as the difference between the amount of sick-benefits and wages decreases. However, it must be kept in mind that there is a higher percentage of older men among the married men, and that with age alone the incidence of time off by reason of illness increases. Moreover, thought must be given to the fact that although proportionally the loss in wages is less for the married man than for the single man, in the case of the former every loss, however small, is of great significance.

The argument that the amount of sick benefit and the difference between sick benefits and wages cannot influence the health figures, because the doctor passes upon illnesses, is not altogether tenable, inasmuch as the decision whether one who is not feeling quite well, should report sick, is determined on the one hand by the results of continuing at work, and, on the other hand, by the effects upon the worker and his family. If the difference between wage and sickness benefits is small, the worker considers reporting to the doctor in the case of even minor illnesses; if the decrease is large and difficult to bear, the worker drags himself to work even though he is seriously ill.

Other comments on illness and accidents can be cited. Perhaps the best illustration of what has already been said concerning the dependence upon circumstance of the worker's reaction

to similar situations is to be found in his attitude toward a proposed reduction of force in the plant. The danger of losing his job may lead either to an increase or to a decrease in production. It leads to a decrease when there is an absence of urging, on the part of the plant management, due to the absence of a market for the product. In this case the worker tries to "stretch the work" and thereby to postpone discharge as long as possible. Increased production results, if the worker believes that the least efficient workers are to be discharged first and the most efficient to be retained longest. No example shows as well as this the complexity of the situation, the fact that it requires concrete study on the spot and personal contact with plant managers and workers, and that nothing can be accomplished by an arm-chair analysis of the situation.

I hope that I have been able to give an indication of the broad scope of the committees-investigation and at the same time to demonstrate that the procedure employed in its inquiry is of value from the viewpoint of the psychology of work. I have been particularly interested in pointing out the close relationship between such problems in the psychology of work and the broader field of the science of labor. On the one hand the psychologist interested in work must not cease to be a psychologist, yet, on the other hand, the psychological problems can only be resolved when considered in their relation to other factors in the field of the science of labor. It is this close relationship which has led me in this report to overstep the bounds of psychology in its narrower sense.

Manuscript received September 8, 1929

News Notes

PERSONNEL RESEARCH FEDERATION

Activities of Member Organizations

University of Pennsylvania Department of Industrial Research

The following report of the Department of Industrial Research, University of Pennsylvania, is sent by the Director, Joseph H. Willits.

Established at the Wharton School of Finance and Commerce early in 1921, the purpose of this department is to "apply the methods of thorough scientific research to various fundamental problems in industry, such as industrial relations, so that human well-being, and especially the more general distribution of human well-being, may be increased, and to provide a bureau to which the various elements of the industrial community may turn for scientific research on industrial problems."

The research has been and is on co-operative lines, the first undertaken being a study of monthly labor turnover in 25 plants in diverse industries in Philadelphia. The reporting was continued through 1928 and led to the publication of "Labor Mobility" and "Four Years of Labor Mobility." Work by members of the staff with the United States Coal Commission, 1923, resulted in the publication of "Earnings of Coal Miners," "Conclusions and Recommendations of the United States Coal Commission as to Labor Relations in Bituminous Mining," and several chapters in "What the Coal Commission Found." "The Trend of Wage Earners' Savings" was the result of a study of savings institutions and methods in Philadelphia over a considerable period.

Co-operation with the Metal Manufacturers' Association of Philadelphia gave the department information on labor turnover, factory lunch rooms, accidents and accident prevention methods, and earnings of metal

workers. Mimeographed reports on these subjects have been issued to the co-operating companies.

The original material for the study entitled "Earnings and Working Opportunity in the Upholstery Weavers' Trade," came from the members of a local union in the form of weekly reports of earnings and hours over a two-year period. "Collective Bargaining in the Photo-Engraving Industry" came from employers and union officials in the industry as well as a survey of the literature.

Monthly records of production and shipments of 49 iron and steel foundries, originally sent to the Philadelphia Federal Reserve Bank, supply material for a monthly report as well as for the study "Trends in Foundry Production." The results of a survey of the production of knitting machinery and of full-fashioned hosiery are contained in "Significant Post-War Changes in the Full-Fashioned Hosiery Industry."

Further research in the field is now being conducted on the subject of output of hosiery manufacturers and earnings and working time of a group of workers in the industry. The co-operation of the employers and of the union is making the repective studies possible.

"Earnings in Certain Standard Machine-Tool Occupations" is a further development of the material supplied by the metal manufacturing plants, with the addition of some intensive data in a smaller group of plants.

Data from woolen and worsted spinners is incorporated in the "Analysis of Production of Worsted Sales Yarn."

The analysis of "Help-wanted Advertising as an Indicator of the Demand for Labor" makes use of the classified advertising in daily newspapers with considerable attention to the various occupations and industries specified in the advertisements.

Further studies now in progress concern

the unemployment situation in Philadelphia, the use of the group-bonus as an incentive, the effect of mechanization on workmen, an index of wage rates in the bituminous coal fields, and a study of earnings and selling costs of salesclerks in a representative group of department stores.

Western Electric Company

The latest Report to Stockholders of the Western Electric Company reveals that there was an increase of 50 per cent in the number of employees during the year, from 56,324 at January 1st to 84,848 at December 31st. As was expected the increase was greatest in the Manufacturing and Installation Departments, where the rapidity of the increase threw a heavy burden upon the supervisory forces in planning the work and instructing new employees.

The Company has been active for many years in the movement to prevent industrial accidents by not only making machines and processes safe, but also in training its employees in habits of safety. The results of this educational campaign are indicated by the fact that notwithstanding the large number of new employees, the relative number of accidents has been steadily decreasing, and now stands close to the lowest point in the history of the Company. Continued efforts have also been made, with satisfactory results, through the conduct of health courses, to instill in the minds of employees proper regard for their physical condition.

Opportunities offered to the Company's employees for self-improvement through study outside business hours have continued in popularity. During the year there were more than 10,000 employees enrolled in more than 300 evening classes held each week.

Deductions from salaries and wages authorized by employees for thrift purposes amounted to \$11,774,000 or 8.9 per cent of the total payroll, amounting to upwards of \$132,000,000. This compares with 9.8 per cent in 1928, the decrease being largely due to the number of employees who have been with the Company too short a period to take full advantage of these opportunities.

University of Chicago Board of Vocational Guidance and Placement

Frederic Woodward, Acting President of the University of Chicago, 1928-1929, in his General Statement reports the following:

"Organized in the previous year with the purpose of consolidating the activities of the old Board of Recommendations and the Employment Bureau, the Board of Vocational Guidance and Placement has undertaken the systematic development of business and industrial placement of students at graduation. A promising beginning was made in this new field, and there was a marked increase in the use of the service in the old fields of teacher placement and part-time student employment. Mr. W. H. Cowley, the Executive Secretary of the Board, resigned at the close of the year, and we were fortunate enough to secure as his successor, Mr. Robert C. Woellner, formerly Principal of the University High School."

GRAPHIC ARTS EDUCATIONAL CENTER

A formal request to the Board of Education for a \$2,500,000, building to serve as an educational center for the Graphic Arts Industry was included in a statement issued by a conference on printing education in New York City. The conference which was attended by representatives from all the employer and craftsmen's organizations in the industry, announced the formation of a committee, headed by Peter J. Brady, President of the Federation Bank and former President of the N. Y. State Allied Printing Trades Council, to take charge of a campaign to obtain favorable action on the request. Isaac H. Blanchard, Chairman of Board, Blanchard Press, presided.

The statement issued by the conference follows:

We, the representatives of the employer, union, and allied industries, organizations of the Graphic Arts Industry of New York City, members of a conference on printing education held in New York City on January 30, 1930, desire to record our convictions as to the need for more adequate training facilities for the Graphic Arts Industries of the City of New York.

Printing and its allied trades constitute one of the few industries still dependent upon high standards of individual craftsmanship. In no other major industry does the skill of the individual employee play a larger part and no other industry offers better organized and accepted principles and practices as the content and basis of trade training. Continuance of New York City's national and international supremacy in the trade requires the establishment and maintenance of training opportunities and facilities which will adequately supplement job experience.

Vocational educators are agreed that effective trade and apprentice education comes only through a program of training on the job supplemented by properly related school experiences. There is also general acceptance of the fundamental principle that the public should bear part of the cost of vocational education, particularly when the industry in question touches the vocational lives of so many members of the community as does the Graphic Arts Industry.

The organizations in the Graphic Arts Industry here represented have already shown their appreciation of the need for, and their interest in the educational problems of the industry by co-operating in the maintenance and operation of seven apprentice and pre-apprentice schools, now enrolling more than 3,000 students. Present facilities, however, are seriously inadequate and many technical branches of the industry have no special training facilities of any kind.

Adequate training of craftsmen for the industry can be provided only through the erection of a specially designed central building, serving the entire city and all branches of industry. This fact was recognized as far back as 1918 when an industrial education survey commission of the Board of Education of the City of New York pointed out the urgent and essential need for an educational center for the industry and unanimously recommended the erection of a Graphic Arts Building. The reasons found then for centralizing all educational activities for the graphic arts have become more urgent with the passing of time. At a cost of less than one technical high school

New York can adequately serve the educational needs of its second largest industry which employs nearly 70,000 craftsmen, includes more than 3000 firms and produces nearly one-fourth of the printing of the United States and one-twelfth of that of the world.

In accordance with these convictions we join together in urging the Board of Education to include in its 1930 budget an item of \$2,500,000 to provide for the erection of an educational center for the Graphic Arts Industry.

We recommend, also, that the members of this conference urge their respective organizations to pass resolutions favoring this project.

Finally, we recommend the appointment of eight members of the conference to serve as a steering committee in charge of a program of activity which will effectively bring before the Board of Education the essential need for, and significance of, this proposal.

THEOLOGICAL EDUCATION TO BE SURVEYED

A three-year study has been started to discover the true condition of theological education in this country. It is being made by the Conference of Theological Seminaries and the Institute of Social and Religious Research. Professor Mark A. May of the Department of Psychology of Yale University is director of the study, while Dr. William Adams Brown of Union Theological Seminary is theological consultant. Among the members of the executive committee are:

Dr. Douglas Mackenzie, president of Hartford Seminary.

Dr. Lutheran Allan Weigle of Yale Divinity School.

Dr. George Warren Richards, president of the Theological Seminary of the Reformed Church in the United States at Lancaster, Pa.

Dr. Ezra Squier Tipple, until recently president of Drew Theological Seminary.

Dr. Shailer Mathews, dean of the Divinity School of the University of Chicago.

Dr. Kirsopp Lake, Winn Professor of Ecclesiastics, Harvard University.

Dr. Charles M. Jacobs, president of Lu-

theran Theological Seminary at Mount Airy, Philadelphia.

Dr. J. Ross Stevenson, president of the Princeton Theological Seminary.

Dr. Hughell Edgar W. Fosbroke, dean of General Theological Seminary, New York.

WESLEYAN UNIVERSITY STUDENT SURVEY

What has been called by authorities the most comprehensive survey of student life and opinion in a college ever projected by the students themselves is being successfully accomplished at Wesleyan University. A 16-page questionnaire prepared by an undergraduate committee, probing the individual's campus life and his reactions to many phases of college, has been answered by over 95 per cent of the student body, a record percentage which will give the findings great practical value when added to data which the University now possesses.

The survey covers the subjects of fraternities, faculty-student relations, athletics, reasons and purposes for coming to college, the curriculum, vocational guidance, and social life.

When analysed, it is expected that the findings will enable the college administration to meet the needs of the student body more faithfully, in matters of curriculum, discipline, and vocational guidance.

UNIVERSITY OF TORONTO

An interesting comment has been received from Professor E. A. Bott of the University of Toronto in regard to the Western Electric Company's industrial relations investigations reported in the February number of the *PERSONNEL JOURNAL*. It says in part, "Putnam's findings and methods in modifying the basic attitudes of employees and supervisors by means of individual interviews and training conferences for supervisors seem to me to be most significant. I am particularly struck by the fact that in all essentials this plan and its results so closely parallel the procedures we have developed during the past five years at the St. George's School for Child Study in the field of Parent Education. Except that (1) the group discussion method is primarily used in Parent Education with

the individual interview as secondary, and (2) that the content pertains to the child-parent relationship rather than the employee-job-supervisor relationship, the situations and procedures are very alike. The method of training parent group leaders by conferences upon the raw data recorded from group discussions corresponds to Putnam's training for supervisors—the objective being the control of attitudes in both cases."

INDUSTRY REPORT

Industry Report is a monthly periodical covering industry, particularly as the human element is involved. It does not attempt a superficial, plausible account of many industries, but goes thoroughly into one each month. A simple explanation of the manufacturing process, illustrations depicting processes, and a job analysis are regular features. Hazards pertaining to the work are analyzed by Dr. Carey P. McCord, an industrial health expert of note and corporate representative of the Industrial Health Conservancy Laboratories to the Personnel Research Federation. The March report is devoted to Composition Roofing, while two subsequent reports deal with Nitrogen Fixation (Synthetic Ammonia), and Copper (Mining, Refining, etc.). Industry Report is published by the Retail Credit Company of Atlanta, Georgia, and costs \$12 annually.

JOURNAL OF HIGHER EDUCATION

The Journal of Higher Education has been founded to serve as the professional journal of the sixty-seven thousand instructors and administrative officers in the colleges, universities, and professional schools of the United States. The editors plan to bring to their constituency reports of the most significant investigations in the instructional, administrative, personnel, and curricular problems in all branches of higher education. The list of associate editors includes representatives from every department of academic responsibility in higher education, and these, co-operating with the editor, will attempt ten times a year to report upon the progress of higher education. The magazine is edited by W. W.

Charters and published by the Ohio State University Press.

SUMMER SCHOOLS

The Summer School of New York University in coöperation with the National Junior Personnel Service announces a series of courses on Vocational Guidance, Counseling and Personnel Service. Registration begins July 3, while the regular Summer Session will extend from July 7 to August 15. The courses being offered are "Personnel Administration," "Counseling Methods," "Vocational Information, Guidance and Placement," all by Professor Anna Y. Reed, and "Course for Deans and Advisers of Men and Women," by Dr. Leonard.

Harvard University offers several courses in Vocational Guidance:

The Principles and Practice of Vocational Guidance, Occupational Information, and Labor Problems, by Dr. Franklin J. Keller.

Counseling and the Administration of Vocational Guidance, by Dr. Richard D. Allen.

Psychology and Vocational Adjustment, and Testing Vocational Aptitudes, by Professor Clark Hull.

Education as Guidance, by Professor John Brewer.

Seminary in Problems of Educational and Vocational Guidance, by Dr. Allen and Professor Brewer.

MECHANICAL ABILITY TESTS

"Tests of Mechanical Ability" by F. M. Earle and A. Macrae is the title of Report No. 3 of the National Institute of Industrial Psychology, London.

'Mechanical ability' is defined as the ability to grasp and to employ the mechanical principles involved in the use of machines and implements. To devise a vocational test which will disclose and estimate this ability satisfactorily, and to examine the psychological and other factors entering

into and affecting such a test, were the essential objects of this investigation.

The tests described and studied all consist in putting together the parts of simple mechanisms. In its final form the test has been standardized, after being applied to over 600 adolescents and young adults individually.

The investigations show that success in this test is influenced (1) by the ability to perceive relations of shape or form and, to a less extent, (2) by general intelligence and (3) by manual dexterity. Although the test here studied is of useful prognostic value for youths up to the age of 15 or 16 who have not yet received any specialized training, the conclusion is reached that for older boys about to enter particular trades additional tests will need to be employed.

SELECTION BY PHOTOGRAPH

A study on the Value of the Photograph in the Selection of Teachers by W. B. Johns and D. A. Worcester was reported in the February number of the *Journal of Applied Psychology*. The general conclusion to which the study leads is that there is little if any value in a photograph as a means of furnishing information about ability to teach, at least as now used by superintendents, secretaries of school boards, and secretaries of placement bureaus. No individual was found who possessed any particular talent for judging teaching ability from photographs. Individuals disagree markedly when they attempt to pick out and name the apparent elements of character in a face as shown by a photograph.

PERSONAL ITEM

Dr. C. S. Yoakum, Dean of the College of Liberal Arts at Northwestern University, returns at the end of the present academic year to the University of Michigan, where he will be Vice President and Director of Educational Investigations.

Personnel Books

EDITED BY DOUGLAS FRYER

The critical reviews published in this issue indicate the breadth and variety of personnel activities. Professor Burt's book surveys the accumulated research of recent years upon the adjustment of the worker while on the job. Mr. Dyon of the Western Electric Company regards this book very highly, and several industrial engineers have been heard to express their appreciation of it as a source book of research to which they have only indirect means of contact. It would be interesting to know how many recall who first used the phrase "The Worker-in-His-Work" which entitles the review. College personnel activities are coming to the front and a review of three of these books by Mr. Distler, Director of Student Personnel at New York University, University Heights Section, is included here. In the last review by I. S. Noall of the State Department of Instruction in Utah, there is collected together as "Tools of the Vocational Office" much useful occupational information. Under "Briefer Mention" are factual reviews of books in related fields, such as vocational information, economics, psychology, sociology; and under "New Books" are listed all recent books of immediate and related interest to workers in the Personnel Field. In this issue are included new books published during the months of February and March. "Personnel Books" went to press on April 1, 1930.

TO UNDERSTAND "THE WORKER-IN-HIS-WORK"

PSYCHOLOGY AND INDUSTRIAL EFFICIENCY.

By H. E. Burt. New York: Appleton,
1929, 390 pp.

Reviewed by A. H. Dyon, Western Electric Company

In his most recent book, Dr. Burt has furnished a companion volume to his *PRINCIPLES OF EMPLOYMENT PSYCHOLOGY*, which appeared in 1926. Interest in the development of selective tests and of scientific employment procedures in general has not slackened; if anything it has considerably increased. During the past few years, however, there has also been a growing

recognition of the need for scientific study of the factors which affect the employee's efficiency after he has been hired. It is this phase of the man-power problem with which *PSYCHOLOGY AND INDUSTRIAL EFFICIENCY* is concerned.

Studies of industrial education, methods of work, fatigue, monotony, the working environment, morale, accidents, and effi-

ciency in executive work comprise the subject matter of the book. In dealing with these topics over-technicality has been avoided for the sake of a clear presentation to the student or business executive not interested in the statistical refinements which such studies involve. On the other hand, the author has stressed the importance of thorough-going, scientific methods if the results of industrial research are expected to be of any value.

In a comprehensive chapter on education the fundamentals of learning as demonstrated in the laboratory are applied to the industrial situation. By definite examples it is shown how these principles may be used to advantage in the instruction of the worker. For instance, results of experiments are given to show the general desirability of emphasizing accuracy rather than speed for the worker learning a new process. The author also describes several special devices to facilitate instruction. The stereoscopic principle to give the third dimension, or perception of depth, in showing industrial films and apparatus to provide an accurate record of a worker's progress in learning certain filing operations are illustrative. A new scheme of apprentice training is outlined as a substitute for less efficient methods which have been frequently employed. Sections on the training of foremen and salesmen are also included in this chapter.

Ways of determining the most effective methods of work are presented by reference to a number of specific cases. While the Gilbreth bricklayer classic is included, and effectively so, other less well known types of study will be found of equal interest. One of these, for example, deals with the nature of the stimulus and type of concentration as affecting the speed of reaction. The value of rhythm, the worker's posture, the suitability of tools, and similar questions come in for detailed treatment.

The importance of the fatigue problem is too obvious to require stressing. While the discussion is necessarily compressed, the problem is clearly stated and sufficiently illustrated with details of laboratory and industrial experiments. It is pointed out

that the measurement of fatigue still depends very largely upon production and accident records. Many instances are cited to suggest the possible gains accruing from even the partial elimination of fatigue. Quite needless fatigue, arising out of such obvious factors as noise, faulty illumination, inefficient tool equipment, etc., may be readily eliminated as a matter of technical adjustments. Shortened hours and rest pauses, especially the latter, are shown to have a marked effect in the reduction of fatigue.

Much less is known about the problem of monotony. Boredom is a subtle thing. One person is happy with a repetitive task; another is bored with work of a varied and complex nature. Dr. Burt's phrasing is more picturesque: "What is beefsteak for one individual may be potassium cyanide for another." A few laboratory studies are described and suggestions offered for the alleviation of monotony, but progress in this field has scarcely begun.

The discussion of working environment centers on the factors of illumination and ventilation. The following serves to illustrate the importance of proper illumination: "The National Safety Council mentions 91,000 accidents of which 24 per cent were wholly or in part due to poor lighting. Some of the manufacturers have reduced accidents 50 to 75 per cent by better illumination. At a rough estimate four and one-half billion dollars are lost annually in the United States through lowered production or accidents caused by poor light." By way of contrast, the New York post office, through improvements in illumination, effected operating economies amounting to \$109,000 per year. The relation of visual adaptation to accidents, the influence of light distribution and similar questions are given careful analysis.

Ventilation—with temperature and humidity the important factors—is considered with reference to mental efficiency, industrial production and accidents, seasonal fluctuation, and the like.

In the discussion of other topics, frequent mention is necessarily made of accidents. The author therefore requires only

a brief chapter for summarizing the psychological aspects of this problem.

Of recent years, increasing attention has been given by industry to considerations of worker satisfaction and morale. The indications of and the reasons for this trend are too well known to require comment. The whole subject, closely related to the other factors of industrial efficiency, is given detailed treatment. To a review of familiar but very significant material is added mention of the newer possibilities of the psychiatric approach, at present a wide open field for experiment. In attacking one of industry's most important personnel problems, no contribution should be overlooked.

Before concluding, the author adds a chapter to discuss the relation of attention, memory, habit formation, and interest to efficiency in executive work.

Writing with obvious scientific restraint, Dr. Burt has carefully avoided overstatement of results or extravagant claims for the value of the methods under discussion. There is little room to dispute that he has accomplished his purpose to provide not only an adequate text for college instruction but also an analysis which will be helpful to the business reader. For industry, its value lies in defining the problems of industrial efficiency, in reporting accomplishments to date, and in suggesting

directions in which further effort may be profitably spent.

This review would be incomplete without a closing reference to a most important item, namely, the attitude of employees toward all experimental work in this field. There at times has been considerable misunderstanding, even hostility, to such research. Workers have been cold to efforts designed, in their thinking, to "speed them up." The best results can of course be obtained only with the active cooperation of all concerned. To this end, the worker and those interested in his welfare should have no misunderstanding of the position of industrial psychology. Dr. Burt has been careful to emphasize the point, and states it effectively when he says: "There is nothing in the psychologist's bag of tricks designed to drive the worker or induce him to exert an unfair degree of effort. It is rather a question of finding better ways for him to work so that with the same effort he may accomplish more. In many cases it is a matter of merely removing some obstruction to his efficiency. . . . Misdirected activity is a loss both to the company and to the worker. . . . We are not proposing to promote efficiency at the expense of happiness, but to produce operatives who are happier because they are more efficient."

OBJECTIFYING EMPLOYMENT PROBLEMS

THE PRESTIGE VALUE OF PUBLIC EMPLOYMENT. By Leonard D. White and Thomas V. Smith. Chicago: University of Chicago Press, 1929, x + 183 pp., \$2.50.

HELP-WANTED ADVERTISING AS AN INDICATOR OF THE DEMAND FOR LABOR. By Anne Bezanson. Philadelphia: University of Pennsylvania Press, 1929, xii + 104 pp., \$2.00.

Reviewed by L. D. Hartson, Oberlin College

Dr. White's investigation, undertaken by the Community Research Committee of the University of Chicago, is a study of professional morale. The aim of the project was to compare the prestige value of employment by the city of Chicago with employment by private corporations. Opinions were obtained from 4,680 citizens of Chicago by interview and the use of printed schedules. The first sheet presented twenty

paired occupations, one of which is in each case public, the other private. The second part of this schedule introduced a series of questions intended (1) to reveal general opinion about, and experience with, public officials and employees, and (2) to reveal opinions on some of the bases of judgment of public employment, such as courtesy, competence, publicity value, experience value, permanence, etc. Data were also obtained

from 690 other persons on a second schedule consisting of a word-association test, a rating scale and a completion test.

Prestige indices were computed which indicate that public employment is held in highest repute by the women, the young, the unskilled laborers, the foreign born and the lowest economic groups. Nearly five thousand representative citizens, taken collectively, expressed a substantial preference for private employment and rated city employees much lower than persons in similar occupations in the commercial world.

In Miss Bezanson's monograph, the Industrial Research Department of the University of Pennsylvania, has presented a detailed summary of the help-wanted advertising in the newspapers of Philadelphia from April, 1923 until August, 1929. Comparative data are reported from five other cities. Detailed consideration is given to six major industries: building construction, automobile manufacturing, metal manufacturing, hosiery and knit goods, and other textile industries, and to twenty-two specialized occupations. The object was to measure the changes in opportunities for employment in certain representative occupations, as indicated by the space devoted to advertising for persons to fill such positions, and to test the relative usefulness of the advertising index.

As an indication of the value of the help-wanted index to the personnel administrator, two of the more significant conclusions may be cited. (1) An intensive study of the metal manufacturing industry showed that the help-wanted index is a more sensitive indicator of changes in personnel than are the indices for the number of workers on the payroll, labor turnover, or accessions. (2) The classified help-wanted index is a good instrument for measuring the demand for different types of labor. This index is a very useful basis for planning for future needs both in placement and training. To the economist and vocational counselor the index indicates the direction of the currents of employment. For instance, for the last three years in the metal industry in Philadelphia, there has been a pressing demand for skilled workers: machinists, tool-makers, draftsmen, electricians, welders, etc., whereas the demand for unskilled laborers has been negligible.

Both studies are interesting illustrations of the adaptation of objective methods to the social science field. The Philadelphia study reports an evaluation of a hitherto unutilized source of data which promises to be of much value to personnel workers. The Chicago investigation illustrates a successful adaptation of objective tests for the purpose of registering personal opinion.

INDUSTRY SOCIALLY CONSCIOUS

SOCIAL ASPECTS OF INDUSTRY. By S.
Howard Patterson. New York: McGraw-
Hill, 1929, 539 pp.

Reviewed by Myer Bloomfield, New York City

It is in the sub-title "A Survey of Labor Problems and Causes of Industrial Unrest" that Dr. Patterson of the Wharton School best indicates the particular subject matter of this substantial volume. While presumably written for the teacher and the classroom, a service much needed at the present time when we consider what it means to choose text material from a library-full abundance of specialized labor and industrial literature, this book is about as useful an all-round introduction to industry's social

problems as the busy man of affairs, who values straight thinking, is likely to find. It is an unusually easy book to read and to refer to, especially the latter.

Problems are best understood in terms of their background. So this survey starts with the pre-problem stages of modern industrial development. The matter is familiar enough, but always worth recalling; and, as given here, compactly, logically, and with touches of interpretation and inter-relating with present situations, the ma-

terial takes on fresh significance. Problems of income and the wage-earner's standard of living are central problems of any industrial civilization. When these are partially met, social thinking, enlightened industrial administration, and legislation become free to deal with questions other than the marginal. The middle portions of Dr. Patterson's survey, therefore, deal with national prosperity, wage developments, industrial legislation, and the processes of organized labor relations. How tentative and experimental all such processes have had to be in a world not yet ready for the engineering approach to employment relationships, the author's simple outline of the facts makes crystal-clear.

Economic necessity is the great reformer and transformer. Disputes may rage and polemics crowd the ether but when sound business development calls for new policies and adjustments, when the necessity for

success or solvency calls for better understandings, then there is a ready scrapping both of obsolete viewpoints and of machinery.

At least this readiness has marked the growth of some of our great industrial establishments under the leadership of men of understanding and cooperating gifts. And fittingly, Dr. Patterson concludes his survey with praises of employer contributions to the modernizing of industry. Problems of reconstruction remain. Never has industry therefore been at a more interesting stage. In the closing chapter a sense of this challenging future is brought home to the reader.

Worthy of special mention are the summary, the brief list of collateral reading, the list of references, the questions for discussion, and topics for investigation which end each section of the book.

COLLEGE GUIDANCE EMPHASIZED

COUNSELING THE COLLEGE STUDENT. By Helen D. Bragdon. Cambridge: Harvard University Press, 1929, x + 162 pp., \$2.50.

PROBLEMS OF STUDENT GUIDANCE. By Maurice S. Sheehy. Philadelphia: Dolphin Press, 1929, viii + 264 pp., \$2.50.

EVERY COLLEGE STUDENT'S PROBLEMS. By Oscar Helmuth Werner. Silver, Burdett, 1929, xi + 370 + xxix pp., \$3.00.

Reviewed by Theodore A. Distler, New York University

Personnel work needs active stimulation through research; it is particularly gratifying to list three new books in this field. The three volumes noted above lay primary emphasis on the guidance problems of college students. Miss Bragdon's book will prove interesting to those engaged in counseling women college students. The Reverend Sheehy's volume should be, for two reasons, of primary interest to all people doing guidance work on the college level: first, because it is an explanation of fundamentally sound guidance principals, and second, because it is a thorough-going analysis of the present status of guidance in the outstanding male Catholic colleges in America. Professor Werner's book might reasonably be called a "college student's guide book." It is directed more to the

student than to the guidance worker but gives the guidance worker a fairly comprehensive survey of Professor Werner's idea of the besetting problems of college students.

This is a time when the college personnel movement needs factual research. A few interesting facts upon counseling problems in several of the girls' colleges in the East will be found in COUNSELING THE COLLEGE STUDENT, but the book is largely a collection of opinion and is quite unsuccessful in indicating the present scope, types, and possible solutions of counseling problems in women's colleges. In strange contrast to the text of the book is a list at the end of the book of clear-cut proposals and recommendations for the organization and functioning of personnel activities. There are

unsatisfactory chapters upon college background, the counsel interview, and administration of counseling activities. The book offers a fairly complete list of student problems, but neglects to mention most of those of emotional adjustment.

PROBLEMS OF STUDENT GUIDANCE or a "Study of Administrative Attitudes on Current Practices Prevalent in American Catholic Colleges" confines itself to thirty-seven Catholic Colleges, each of which designated a man to serve on a committee for a cooperative study. The Reverend Sheehy has with their help made an extremely valuable contribution to the college personnel movement.

The problems of student guidance in the Catholic Colleges are discussed in detail. The author, in writing of the freshman, pre-registration functions, guidance steps, discipline, plan of life, health and religion, brings to these subjects a profound understanding of human nature and of guidance at the college level. The text abounds in thought-provoking bits. In speaking of individual record forms the Reverend Sheehy says, "The philosophy of education that dominates a school will be evident in the records kept of its students." Later when speaking of the interview he points out that "the student's problem must remain in the

student's problem." It is as refreshing as a walk on a clear, cold day to wander through the soundly interesting pages of the Reverend Sheehy's book. In spite of the fact that it deals only with the problems of certain Catholic Colleges, the majority of the principles and practices emphasized make its reading worth while for all people seriously interested in personnel work.

EVERY COLLEGE STUDENT'S PROBLEMS is a handbook on college problems and college life, which is written for the undergraduate. Beginning with an inspirational message to college men, it treats in its various chapters of those problems which are likely to trouble students, and in each case suggests means of solving such problems. The following are a sample of what is covered: budgeting of time, money, and effort; study methods, personality, health, use of the library; note taking; behavior; thinking, etc. It is an excellent book for advisers to recommend to both college students and those who contemplate entering college. But the book is not without its weak points. Some of the "facts" are questionable which are brought to bear on the problem of "Does a College Education Pay." Then the important subject of extracurricular activities is almost entirely neglected in the discussion.

TOOLS OF THE VOCATIONAL OFFICE

1. **ELEMENTS OF JOURNALISM.** By Mary J. J. Wrinn. New York: Harper, 1929, xviii + 300 pp., \$1.80.
2. **BOOKS: FROM THE M.S. TO THE BOOKSELLER.** By John L. Young. New York: Isaac Pitman, 1929, x + 121 pp., \$1.00.
3. **SIGNIFICANT POST-WAR CHANGES IN THE FULL-FASHIONED HOSIERY INDUSTRY.** By George William Taylor. Philadelphia: University of Pennsylvania Press, Research Studies IV, 1929, xl + 130 pp., \$2.00.
4. **LABOR AND SILK.** By Grace Hutchins. New York: International Publishers, 1929, 192 pp., \$1.00.
5. **LABOR AND AUTOMOBILES.** By Robert W. Dunn. New York: International Publishers, 1929, 224 pp., \$1.00.
6. **TRENDS IN FOUNDRY PRODUCTION.** By Anne Bezanson and Robert Gray. Philadelphia: University of Pennsylvania Press, Research Studies No. III, 1929, xvi + 77 pp., \$1.50.
7. **ELECTRICAL MACHINERY AND INDUSTRIAL ENGINEERING.** By Alfred F. Dressler. New York: Electrical Trade School, Reference No. 2, 1929, 77 pp.
8. **TOMORROW'S ADVERTISERS AND THEIR ADVERTISING AGENCIES.** By George Harrison Phelps. New York: Harper, 1929, x + 256 pp.
9. **AN EXAMINATION OF EARNINGS IN CERTAIN STANDARD MACHINE TOOL OCCUPATIONS IN PHILADELPHIA.** By H. Larue Frain. Philadelphia: University of Pennsylvania Press, 1929, xiv + 85 pp., \$1.50.

Reviewed by I. S. Noall, Department of Instruction, Utah

Vocational information is an essential tool in the vocational office. Presented in interesting form it is used to stimulate the child to early thinking upon his vocational problems. The guidance bureau which does not collect vocational information and make it accessible to boys and girls is neglecting a major function of its work.

Vocational information can be secured from various sources. The best source is the job analysis. But there are other means of collecting vocational information when such studies of the occupations have not been made. There is being published today a large number of books offering facts about the vocations. Most of them are not written from the vocational guidance viewpoint. But they include statistical facts about production, wages, distribution of labor, and above all, changing vocational conditions. Such facts are a part of the material needed by the boy or girl in making his choices of a vocation.

A number of these books are reviewed below. They are referred to by number in the bibliography above.

1. The study of journalism proposes a plan for training high school students in the principles and art of this occupation. Brief explanation and discussion of principles are amply illustrated by samples culled from best newspaper practice as patterns for students to model after. While journalism is usually considered to be a college subject, the feasibility of the plan as a high school undertaking is vouchsafed by its successful application by the author in the George Washington High School of New York City. It should be an invaluable asset to schools maintaining weekly or monthly publications. When so used, its value as a system of guidance, through participation, is of the finest quality.

2. The semi-technical volume upon the manufacture of books warrants its place in Pitman's Common Commodities and Industries Series. It presents the pertinent facts every author and other well informed person should know about the publication of a book, including the selection of a publisher, the sale of the M. S., the type, composition, illustration, make-up of the book and its

ultimate marketing. It is an excellent addition to the secondary school and public library literature on vocations and industries.

3. Increasing mechanization, greater production and the introduction of new styles are changes which have characterized the hosiery industry during the past ten years. The volume upon this subject is intended to show pertinent trends in the industry as a guide to manufacturers of machinery, managers of hosiery mills and labor organizations in the determination of practices and policies.

Trends indicated are: Marked increase in production of full fashioned silk hosiery, totaling 300 per cent increase between 1924 and 1929; increase in equipment to equal production demand by late 1926; near discontinuance in the use of cotton in full fashioned hosiery; reduction in output of seamless goods; marked per capita increase in consumption, recent over equipment, and installation of new machinery designed to manufacture only sheer stockings.

4. LABOR AND SILK is the first of a series of studies proposed by the Labor Research Association as a Labor and Industries Series. It is designed to present the workers' problems and outlook in certain basic industries. Representing an avowedly labor point of view, it emphasizes the grievances and hardships of the worker and the problems anticipated in organizing the industry for collective bargaining.

Miss Hutchings has traveled through the chief silk producing countries of the world and has spent five years in the gathering of data for this volume. The pitting of the southern mills against the northern, the speeding up of labor, the lowering of wages and unemployment are problems treated. While it is admitted that the rationalization of industry will undoubtedly continue, a part of the gains are claimed for the worker whose present lot is held to be untenable.

5. LABOR AND AUTOMOBILES is the second of the ten studies proposed by the Labor Research Association. It presents the story of the meteoric growth of the automobile industry and its unbelievable profits to the successful owners. In contrast, the

mechanization of the industry, the speeding up of work, and the subjugation of the worker are vividly described. The author claims that wide-spread advertising for help, even in the face of labor surplus in manufacturing centers, has created such an over supply of men that the wages and conditions of work are easily dictated by the employers, and are becoming most unsatisfactory to workers.

To date all efforts to organize the workers in the interest of securing better working conditions through collective bargaining have been futile and the American Federation of Labor considers the task impossible. A modern up-to-date factory workers' union is proposed that "will cover the whole industry as well as every operation in the plant," and include "all workers regardless of skill, nationality, color, sex, or age."

6. The study of Bezanson and Gray shows the trends of foundry production of gray iron and steel in and about Philadelphia during the years 1926 to 1929 inclusive. Output in small foundries closely parallels that of the larger plants. City foundries are gaining on the rural institutions and maintained 56 per cent capacity production in 1928 as against 33.8 per cent in outside plants. Causes of over capacity and over stock in relation to the volume of business are discussed, together with suggestions for balancing the seasons' demands. The information in this volume on the steel and foundry industry is of primary interest to those in the Philadelphia region.

7. The volume by Alfred F. Dressler is a brief hand book and reference designed as a guide in trade practice and as a laboratory manual in connection with courses on the installation and maintenance of electrical machinery offered at the New York Electrical School. Professor Dressler describes the chief characteristics and hookups of A. C. and D. C. motors, generators, transformers, storage batteries, etc. in Section I. In Section II under *Industrial Engineering* he treats the use of the slide rule, trigonometric functions and logarithms in electrical measurements and calculations.

8. Here is a popular treatment upon ad-

vertising that at once tells advertisers how to make the most of their advertising and agencies what they must do to "deliver." While non-technical in treatment Mr. Phelps makes good in his effort to put over the message that the coming years will demand a service that is both an art and a profession.

9. Dr. Frain offers an interesting study of the variability wages and of factors contributing to the same. The data, taken as they are, from many plants and for closely related machine operations, contribute to the answer to the question, "Is there a 'market wage' in any locality or in any given occupation, assuming that the 'market' is normal and competitive?"

As indicated above, these publications are a sampling from the large volume of similar literature issuing from our press every year. None of them are presented for the specific function of vocational guidance. Two of them though strictly controversial in nature present an expression of the labor issue that will be of wide interest to persons in these industries and whose children are following in the parents' footsteps. They also indicate the controversy between labor and capital that is less pronounced but none the less present in much of our modern industry. Three of the volumes are trade or industry studies designed for employers' use in determining policies of management. However, the data presented show trends of wages, periods of employment and manufacturing changes. These are of interest to workers in the industries reported. They are also indicative of trends that occur and may be observed in other fields. *ELEMENTS OF JOURNALISM* and *ELECTRICAL MACHINERY* will find direct use as school texts. The former will exert an influence in guidance; the latter assumes that a vocational choice has been made. *BOOKS* is a handbook as well as a source of popular information. Every boy and girl in the secondary schools should read it. *TOMORROW'S ADVERTISERS* is a prophecy of the future. As such, it will be a guide and a stimulus to those in the business. It will also strike fire with the young hopeful who has talent and who is now groping to find his place in the sun.

Briefer Mention

Occupations for College Women. A Bibliography. By Chase Going Woodhouse and Ruth Frances Yeomans. Greensboro, N. C.: Bul. No. 1 of the North Carolina College for Women, 1929, 290 pp.

A bibliography of 1801 references to books and articles, published from 1920 to 1923 inclusive, for the vocational guidance of college women. Each reference is annotated, to indicate the kind of information. Where available, Library of Congress and Dewey Decimal classification numbers are cited. The classification of material is suggested by the following topics: The Arts, Manufacturing, Education, Engineering, Banking, Health, Legal Fields, Museum Work, Married Women's Work, Vocational Tests, List of Professional Periodicals. It is planned by the Institute of Women's Professional Relations, by whom this bibliography is issued, to publish a yearly supplement.

Fixation of Wages in Australia. By George Anderson. Melbourne: Macmillan, 1929, 568 pp, \$3.50.

The system of compulsory arbitration of labor disputes has been in effect in part or all of Australia since 1895, yet strikes are not unknown, and the decisions of the Arbitration courts have been frequently defied. One source of difficulty has been conflict between Commonwealth and State jurisdiction; another in the jurisdictional disputes between labor unions, and still another in the administration of the laws. The first half of this book describes the various tribunals which have been set up for the fixing of wages, and the second half presents the decisions which they have made. By classifying the cases according to the subject at issue, the author presents the principles which have been established for the fixation of wages.

Economics and Ethics: A Study in Social Values. By John A. Hobson. New York: Heath, 1929, xxxi plus 489 pp.

This book is an attempt to redefine economic concepts in terms of human

welfare. The difficulty in securing a generally acceptable definition of welfare is recognized, and solved by the substitution of a "hierarchy of values" which admits many forms of welfare. Ethics is the science and the art of valuation.

Emphasis upon other values than material ones will force, and is forcing, economic theory to enlarge its scope. Instead of mere description of things as they are, it must consider the problem of how the economic system may be made to serve the interests of human welfare. The author is particularly interested in the application of these principles to standards of living, international relations and incentives to labor.

A Study of Introvert-Extravert Responses to Certain Test Situations. By R. A. Schwegler. Columbia University Contributions to Education, No. 361, 1929, 183 pp.

A battery of 12 tests was administered to 103 introverts and 103 extraverts who were selected by the Martson scale. The introvert is found to be slower in verbal response, less productive of words, ideas, and movements, slightly more tenacious in holding to the evidence of own experience, and more aware of morbid anxieties and psychopathic thinking. In the free association test, short reaction time and superficial responses characterized the extravert, while longer reaction time and profounder responses characterized the introvert. Introverts appeared much less willing to 'take a chance' in mental tests than did extraverts. The introverts were definitely slower in manual movements, particularly when under pressure, and the emotional life of the extravert was admitted to be much freer and more vivid. Intelligence and age were not factors in these differences. There is an excellent bibliography.

The Psychology of Adolescence. By Fowler D. Brooks. Boston: Houghton, Mifflin, 1929, 630 pp.

This volume, which is apparently in-

tended as a college textbook in secondary education, brings together a large amount of scientific literature. The first six chapters (175 pages) are devoted to the field of physical and physiological development, and the measurements which have been obtained in these fields over a long period of time. From this point on, the treatment is from the viewpoint of the author's own beliefs, and the methods of older educational writers are used in the discussion of the problems of adolescence.

Scientific Method. Its Function in Research and in Education. By Truman L. Kelley. Columbus: Ohio State University Press, 1929, 195 pp.

Five lectures upon the method of research, the rôle of human opinion in science, psychological units of measurements, the bearing of scientific development upon life, and the mental traits of men of science, are included in this volume. In an analysis of the mental traits of men of science, Kelley is led to conclude that there are no exceptions to the following: (a) The great man of science is industrious. (b) He questions authority in his field of achievement. (c) He is apt at drawing inferences. (d) His sense of logic is sound. (e) He is a keen observer. (f) He is dependent on observed facts. (g) He is inventive in the matter of techniques. (h) He is rich in number of hypotheses. (i) His hypotheses are amenable to observational tests.

Our Economic Life: A General Social Science. By Thomas Nixon Carver and

Gladys Marion Adams. Philadelphia: Winston, 1929, x plus 373 pp.

This book is an introduction to the social sciences, designed for high school students. It starts with a brief account of the Industrial Revolution. The body of the book is devoted to a simple exposition of present-day economic organization and the final chapters introduce the student to some of the more obvious social problems, such as those of the "social misfit" and the immigrant. Social coöperation is stressed as the general method of solution for these problems. A unique feature of the book is in its illustrations, which are almost entirely cartoons. Academic terminology is avoided, and such technical terms as are used are defined in a glossary at the end of the book.

The Oldest Profession in the World. Its Underlying Causes, Its Treatment and Its Future. By William J. Robinson. New York: Eugenics Publishing Company, 1929, 100 pp., sold by subscription only.

The well-known author of many guidance books upon sex problems writes a factual statement of present conditions in the profession of prostitution and its place in the lives of people. The fundamental cause of prostitution is given as "the existence of the sex instinct and the imperative need of its satisfaction." Prostitutes are found to be morally, mentally, and physically as normal as the average woman in other walks of life. The thesis is advanced that prostitution should have the same legal and social status as other occupations.

New Books

LABOR RELATIONS

CARROLL, M. R. *Unemployment Insurance in Germany.* Washington: Bookings Inst., 1930.

CHILDS, H. L. *Labor and Capital in National Politics.* Columbus: Ohio State Univ. Press, 1930, 286 pp., \$3.00.

GIBBERD, KATHLEEN. *Workmen's Fare.* London: B. C. M., 1930, 128 pp., 3s. 6d. Net.

Industrial Group Insurance. New York: Nat. Ind. Conf. Bd., 1929, 46 pp., 75¢.

ROTHSTEIN, THEODORE. *From Chartism to Laborism.* New York: Int. Pub., 371 pp., \$2.50.

Unions Provide Against Unemployment. Washington: Am. Fed. of Lab. 1929, 109 pp., 75¢.

OCCUPATIONAL ANALYSIS

Illumination Research Committee.⁷⁵ *Technical Papers.* London: H. M. S. O., 1930, 2s. 6d. Net.

STURTEVANT, S. M., AND STRANGE, R. M.

A Personal Study of Deans of Girls in High Schools. New York: T. C., Columbia University, 1929, 157 pp., \$1.50.

MENTAL TESTS AND USES

McADORY, MARGARET. *The Construction and Validation of an Art Test.* New York: T. C., Columbia University, 1929, 35 pp., \$1.50.

MACLAREN, J. P. *Medical Insurance Examination.* New York: Wm. Wood, 1930, 688 pp., \$10.00.

NEWCOMB, T. M. *The Consistency of Certain Extrovert-Introvert Behavior Patterns in 51 Problem Boys.* New York: T. C. Columbia University, 1929, 123 pp., \$1.50.

OLSON, W. C. *The Measurement of Nervous Habits in Normal Children.* Minnesota: Univ. of Minn. Press, 1929, 109 pp., \$2.00.

RUSSELL, CHARLES. *Standard Tests.* Boston: Ginn, 1930, 521 pp., \$2.00.

GUIDANCE (VOCATIONAL AND EDUCATIONAL)

BURNS, C. *An Introduction to the Social Sciences.* London: Allen & U, 1930, 112 pp., 3s. 6d. Net.

PEAR, T. H. *The Art of Study.* London: K. Paul, 1930, 118 pp., 3s. 6d. Net.

SPICER, W. C. *Going to College.* Boston: Stratford, 1930, 34 pp., \$1.00.

MENTAL HEALTH

ADLER, ALFRED. *Problems of Neurosis.* New York: Cosmopolitan, 249 pp., \$3.00.

BIANCHI, LEONARDO. *Foundations of Mental Health.* New York: Appleton, 292 pp., \$2.50.

BURR, B. *Practical Psychology and Psychiatry.* Philadelphia: Davis, 1930, 378 pp., \$2.75.

DEARDEN, HAROLD. *The Science of Happiness.* London: Heinemann, 1930, 316 pp., 5s. Net.

MANAGEMENT AND ADMINISTRATION

DERBY, W. O. *Store Management for Profit.* New York: Harper, 1929, 208 pp., \$3.00.

FORD, HENRY. *My Philosophy of Industry.* Harrap, 1930, 90 pp., 2s. Net.

HUBBARD, ELBERT. *Advertising and Advertisements.* Aurora; Roycrofters, 1929, 276 pp., \$15.00.

RAUTENSTRAUCH, WALTER. *The Successful Control of Profits.* New York: Forbes, 1930, 255 pp., \$3.00.

SHERWOOD, J. F. and others. *Constructive Accounting.* Cincinnati: South-Western Pub. Co., 1929, 252 pp., \$2.50.

SHERWOOD, J. F. and others. *Fundamentals of Accounting.* Cincinnati: South-Western Pub. Co., 1929, 221 pp., \$2.50.

TAYLOR SOCIETY. *Scientific Management in Industry.* New York: Harper, 1929, 498 pp., \$6.00.

TOURNIER, E. J. *Materials Handling Equipment.* New York: McGraw-Hill, 1929, 371 pp., \$4.00.

WALKER, L. C. *The Office and Tomorrow's Business.* New York: Century, 1930, 198 pp., \$1.50.

INDUSTRIAL EDUCATION

AHMAD, Z. U. *Systems of Education: England, Germany, France and India.* London: Longmans, 1930, 8s. 8d. Net.

HARRINGTON, H. L. *Program Making for Junior High Schools.* New York: Macmillan, 181 pp., \$1.75.

JOHNSTON, E. G. *Point Systems and Awards.* New York: Barnes, 175 pp., \$1.00.

NAETHER, C. and RICHARDSON, G. F. *A Course in English for Engineers.* Boston: Ginn, 1930, 344 pp., \$2.60.

PROSSER, C. A. and BASS, M. R. *Adult Education.* New York: Century, 1930, 408 pp., \$2.75.

WEST, MICHAEL. *Language in Education.* London: Longmans, 1930, 4s. 6d. Net.

VOCATIONAL INFORMATION

ALTMAYER, C. L. *Business Communication.* New York: Macmillan, 1930, 511 pp., \$1.80.

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Psychological Study of Accident Proneness*

By ERIC FARMER, *Industrial Health Research Board, London*

Susceptibility to accident is no mere matter of bad luck. It is associated with certain external working conditions, such as unfavorable temperature. It is related even more closely to individual constitution, nervous integration, occupational proficiency, personal habits, preoccupations and attitudes.

This practically important problem of accident causation has been the subject of continuous investigation in England for more than ten years. Results of these highly significant inquiries are here summarized by one of the foremost leaders in this field of research.

THE Industrial Health Research Board, with headquarters in London, receives a Government grant for the purposes of carrying out research on problems connected with the human side of industrial efficiency. Among the many problems to which it has directed its activity is that of accident causation. It has approached the matter from many points. Several of its investigators have contributed to the study of this particular problem. The results of their studies on accident causation are described briefly in this paper.

Mrs. E. Osborne and Dr. H. M. Vernon by installing recording thermographs in two large munition factories were able to record the approximate temperatures at which accidents occurred. Their results showed that ac-

cident incidence was at its lowest at a temperature of 67°F. Dr. H. M. Vernon and Dr. T. Bedford studied the relation between temperature and accident rate in a group of collieries and found that the accident rate of those working at the coal face was in direct relation to the temperature of the seam—the higher the temperature the greater the accident rate. A further investigation carried out by the same investigators showed that the relation between accident rate and temperature was mainly accounted for by the less severe accidents, the rate of which was higher in the hotter seams than in the cooler, whereas the serious accident rate remained approximately the same. They accounted for this by suggesting that there is a tendency for the miners more readily to report minor accidents when working under conditions of extreme heat.

Osborne and Vernon also found from

*Paper presented at a meeting of the Psychological Section of the British Association for the Advancement of Science.

a study of 50,000 accidents in munition factories that accident rate and speed of production were positively related and that the accident incidence when a 12-hour shift was worked was 2.5 times greater than when a 10-hour shift was worked.

This brief mention of some of the work of my colleagues by no means does it justice, but my object is not to discuss their work in any detail but merely to mention it so that it will be seen that accident causation is being studied from many points of view, and that the inquiry is not confined to the particular aspect with which I am more familiar. I now propose to deal in somewhat more detail with that aspect of the problem with which my own work has brought me into closer touch, with a view to indicating the methods adopted and the results obtained, and also the lines that are now being followed in the continuation of the investigation.

In 1919 Dr. M. Greenwood and Miss H. M. Woods were the first to point out that accidents were not normally distributed. They examined the accident distribution of various groups of munition workers exposed to equal risks in order to test three hypotheses that might account for the shape of the curve of frequency distribution.

The hypotheses tested were:

- (1) That all workers are equal in respect of accident liability, so that accidents are truly accidental i.e. the result of chance;
- (2) That all workers start with an equal liability but that the incurring of an accident modifies the chance in respect to further accidents;
- (3) That the liability of workers to sustain accidents is not equal and that some are inherently more liable to sustain them than others.

The result of the statistical analysis carried out by these investigators showed that the last hypothesis, i.e. that individuals differ in accident susceptibility, was the one that best accounted for the facts and they further showed that the frequency curve was J-shaped, which means that the bulk of the accidents in any group is sustained by a relatively small number of individuals in the group.

This early work of Greenwood and Woods was continued by Miss E. M. Newbold when peace conditions had been sufficiently long restored to make the examination of a large number of industrial accident records possible. Newbold examined 16,000 accident records specially kept for the purpose by a large number of firms, and re-tested the hypothesis that Greenwood and Woods had put forward. The result of her work fully confirmed the original conclusions of Greenwood and Woods which may now be regarded as established in view of the extensive data analysed.

Newbold also showed that there was an inverse relation between accidents and age and accidents and experience, the younger and less experienced sustaining more accidents than the older and more experienced. She also found a positive correlation between minor accidents and minor sicknesses, though there was no relation between minor accidents and serious sicknesses; and also that there was a positive correlation between the number of accidents incurred by the workers over different

periods of exposure. Further she devised a statistical test for determining whether the accidents of a group of workers are mainly due to conditions affecting all the workers in approximately the same degree or whether they are mainly due to a small group of workers having an unduly large number of accidents.

The results of these statistical researches are important for psychology for they clearly delineate the psychological problem and also indicate to some extent the methods to be followed and the results that may be expected from a psychological research having a diagnostic end in view.

The psychological investigation that Mr. E. G. Chambers and I carried out was based upon the results of the statistical inquiry. From this we knew:—

- (1) That accidents were not normally distributed, certain people being more susceptible than others, and we endeavoured by means of psychological tests to discover any characteristics which differentiated these people from others;
- (2) That the frequency curve was J-shaped, so that no high correlation could be expected between tests with a normal saddle-backed distribution and accident rate. The distribution of most psychological test scores is saddlebacked and this may be one of the reasons why at present no high correlations have been found between any psychological tests and accident rate;
- (3) That the number of accidents

sustained by an individual in one period correlates with the number sustained in another. This relative permanence of accident proneness enables psychological tests to be compared with accident incidence in some limited observational period and if a positive relation is found between any tests and accident rate in that period it may be assumed with some degree of certainty that the same relation will hold in non-observed periods of exposure, so that the results have a certain degree of permanent value;

(4) That the majority of accidents in any group are sustained by a few individuals. In order, therefore, that a test may be of diagnostic value in regard to accident proneness it should be possible by means of it to detect a small number of people with a high accident rate. A test can be regarded as having fulfilled this condition when the accident rate of those in the lowest quartile is greatly in excess of that of those in the other three quartiles.

The method Chambers and I adopted was to test various groups of industrial workers equally exposed to risk and compare their performance in the tests with their accident rate over as long an observational period as possible. During the course of the investigation various tests were used. It would take too long to describe each test in detail but they included

various intelligence tests, sensori-motor tests of varying complexity, special tests for strength, stereoscopic vision, ocular muscle balance, judgment of speed and pressure, and also for steadiness and hand control. In 1926 the Board published a preliminary report of our work based on the examination of 650 subjects, in which it was shown that those whose performance was below the mean in a particular group of sensori-motor tests had an accident rate 48 per cent greater than that of those who were above the mean. This particular group of sensori-motor tests, which all involved rapid and accurate coördination between afferent nervous impulses and muscular movements, intercorrelated positively among themselves and so were called 'aesthetokinetic' tests to distinguish them from sensori-motor tests in general, which do not intercorrelate except among young children and mental defectives.

Miss Newbold raised the point in her report as to whether major and minor accidents correlated but her data did not permit of her coming to any conclusions. We were fortunate in being able to analyse the accident records of 16,000 dockyard employees and a positive correlation between minor and major accidents was found for most of the trades examined. This conclusion is important because the incidence of major accidents is so small as to make it almost useless for measuring the value of psychological tests for accident proneness. If, however, any psychological tests are found to correlate with minor accidents and it is known that these correlate with major

accidents, then we may be relatively certain that the tests will have diagnostic value not only for minor but also for major accidents, although it is not practicable to measure this directly.

The conclusions put forward in our preliminary report were recognised as needing corroboration and a further report based on the examination of 1843 subjects has recently been published by the Board. The original conclusions are confirmed by this more extensive investigation and a positive relation has also been shown to exist between intelligence and accident rate. When the intelligence and aesthetokinetic tests were combined and weighted according to their relation to accidents it was found that the accident rate of the worst 25 per cent of the subjects was 2.5 times greater than that of the remaining 75 per cent, so that if these tests had been used for selective purposes the accident incidence of the groups examined would have been sensibly reduced.

In some of the groups of subjects examined it was impossible to distinguish between industrial and non-industrial accidents, and moreover in these groups lost time through accidents involved no financial loss to the workers. The accident rate of these subjects tended to increase with experience rather than diminish, as in the case of the other groups and as Miss Newbold had also found in all the purely industrial groups she examined. The inference, therefore, is clear that these records were not reliable indicators of real accident proneness because the inclusion of non-industrial accidents rendered the exposure of

the subjects unequal, and also on account of the tendency to report minor accidents with a view to getting off work. It is interesting, therefore, to find that in these groups there was no relation between any of the tests and accident rate, the tests having a positive relation with accident rate only in the purely industrial groups where these sources of error were not present.

It was also found that tests having a positive relation to accident rate also had a similar relation to industrial proficiency. This conclusion is of value for practical purposes for it means that if these tests were used for vocational purposes, a group of workers would be selected by them who on the whole would be more proficient at their work and have fewer accidents than those rejected by the tests, so that the use of these tests would serve a dual purpose and increase industrial efficiency in two different ways.

Another interesting result was that the correlations between the psychological tests and accidents increased in direct proportion to the length of exposure to risk. It is clear that accident rate can only be taken as equivalent to accident liability if it is the accident rate of the whole working life. This is obviously impossible to record and accident rate can only be obtained for experimental purposes over a limited observational period, but the longer the period from which the rate is obtained the closer will it approximate to a real measure of accident liability. If therefore the correlation coefficients increase in size in proportion to the length of the obser-

vational period, it means that the more reliable the measure of accident liability the closer is its relation to the tests, from which it may be inferred that the tests do in fact measure some factor which is a fundamental constituent of accident proneness, the full effects of which can only be determined when the accident rate of the whole working life is known.

The relation between accidents and the other psychological tests that were used remains indeterminate at present. In psychological testing of this kind it is unwise to draw conclusions unless they are based upon results that have consistently repeated themselves in several groups of sufficient size to reduce the operation of chance to a minimum. The data concerning the other tests does not yet satisfy these requirements and so I do not propose to discuss it. The investigation is being continued and as time goes on sufficient reliable data will be obtained to warrant conclusions being drawn. The relation between intelligence, aesthetokinesis and accidents has been determined and a careful examination of the data gives no indication that further research will yield a closer association between these functions and accidents within groups similar to those examined than that already obtained. It is, however, obvious from the size of the correlation coefficients that there are other determinants in accident proneness besides intelligence and aesthetokinetic coördination, and the relation between other psychological functions and accidents is now being explored. Should positive results be obtained it will be possible to delineate

more accurately the nature of accident proneness and to form a battery of tests that will measure its various constituents.

One outstanding problem in connection with accident causation is whether accident proneness is specific to the occupation or general in nature. There are no data at present to warrant any suggestion as to its solution but the question is obviously one of great importance for practical purposes and efforts are being made to explore it. It is closely connected with the nature of vocational aptitudes and the relative importance of the general and specific constituents.

I have endeavoured to show in this paper that accident causation is being scientifically studied and that some progress has been made, so that we are less ignorant now than we were a decade ago; but I shall have failed in my purpose if I give the impression that anything like a full solution of the many aspects of the problem has been reached. The methods described are capable of considerable development and doubtless other methods will be employed as the work continues. It is to be hoped that further progress will be made so that psychology may render a practical service that will increase industrial efficiency and lessen human suffering.

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A Check on Character Analysis

BY ADELBERT FORD, *University of Michigan*

Spurzheim and the Fowler brothers, Shades of Goll, apostles of phrenology, occasionally return in novel guise, this time under the aegis of "Vitosophy."

A commercial system, based partly on the use of skull measurements and purposing to give accurate character analyses, was applied to a sample of 18 university students under rigidly controlled laboratory conditions. The average correlation of the character analysts' ratings with university grades and self-ratings was not appreciably higher than was obtained by pure chance.

THE prevalence of large numbers of individuals and organizations aiming to sell systems of character analysis to employment departments justifies an occasional check of the value of such enterprises and repeated warning to the psychologically untrained that these activities illustrate good salesmanship but poor science. Our experience has been that most of these so-called character analysts are sincere in their beliefs, but are thoroughly ignorant of even the most simple types of statistical validation.

About a year ago a system under the trade name of "Vitosophy" was brought to our attention, the promoters asking that we make an impartial test of its possible validity. A portion of its technique had been taken over from the phrenological methods of the late Dr. Russel Haigh Windsor. The exponents of the system were undoubtedly sincere, and there was no

evidence of any attempt at dishonesty in working out the validation.

The technique used in arriving at character readings may be outlined as follows. A circular instrument resembling a halo, with a hinged semi-circle swinging over the entire top of the head, was pinned into the aural canal of each external ear. Measurements, with a maximum of $\frac{1}{4}$ inch error, were taken from this instrument to the surface of the skull at a large number of places. The dimensions and curvature of the skull were very accurately indicated by means of graphs for each of the three spatial dimensions. In addition to the blondness or brunetness of the subject, there were noted the heat of the subjects breath on the back of the examiner's hand, the formation of the teeth, and the character of the mouth. If there were other signs used, they escaped our observation.

Due to the large amount of work

required to measure each subject, and the expenditure on equipment, the examiners refused to analyze more than twenty subjects as a basis for validation. In order to secure statistically valid results we had to use an average of several correlations on the same subjects. Actually we used only eighteen subjects, one having been read twice to establish a self consistency rating, and the other having been omitted because of a skull ab-

subject on the following abilities: mathematics, written speech, general science, general scholarship, general intelligence, mechanical ability, musical talent. The first four traits were to be checked against the subjects' average grades made in the university; the general intelligence was compared with the Army Alpha scores; mechanical and musical abilities were estimated on the basis of self ratings of the subjects. In general practice these "character

TABLE 1

Correlations between "Vitosophy" scores and other measurements of ability; also between lottery scores and these measurements of ability

	CORRELATION WITH VITOSOPHY GRADE	CORRELATION WITH LOTTERY GRADE
Mathematical ability, estimated by grades received in university classes.	-.16	-.24
Written speech, estimated by grades received in university classes.....	.32	-.1
Scientific ability, estimated by grades received in university science classes.....	.10	.15
General scholarship, based on average grades in all college classes.....	.23	-.38
General intelligence, as measured by Army Alpha test scores.	-.21	.24
Mechanical ability, as estimated by the subject being measured.	-.55	.16
Musical ability, as estimated by the subject being measured.	-.31	.07
Average correlation for all traits.....	-.08	-.01

normality which the character readers thought would prevent their system from working. We clothed every subject in a gray laboratory coat to cover cues which might be obtained from clothing, forbade the subject to talk during the examination, gave each subject a pseudonym and a serial number on the record sheets to prevent the character readers from looking up the school grades before their final ratings were made.

The "character readers" graded each

analysts" relied heavily on self ratings in selected cases to prove the worth of their system.

In order to show these exponents of phrenology how the results of their system compared with pure chance, we built a lottery box for random drawing of colored marbles. The marks assigned by the "character analysts" were A, B, C, D, and E, corresponding to the system of marking used in the university. Eighteen colored marbles in five colors were used, each color

representing a letter grade. For every letter grade assigned by the examining analyst there was an appropriately colored marble. The distribution of grades represented by the marbles, therefore, was identical with that assigned by the "character analyst." Each subject then had grades assigned for a given trait by drawing colored marbles at random from a hole in the box. Correlation tables were now made showing the relationship of the "Vitosophy" grades to the students college grades, Alpha test, or self rating. Another set of correlation tables was made showing the relationship of the lottery grades to the same measures of ability. We used the Pearson formula for unscattered data:

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \cdot \sum y^2}}$$

The results of the correlations are given in table 1.

According to the assumptions of the "character analyst" the correlations in column one should have been positive every case. The number of negative correlations is about what one would expect on the basis of pure chance, with a small number of cases. It is safe to say, from this table, that the use of "Vitosophy" in predicting scholarship in the university is worthless, or at least not proven. Where self ratings are made the basis of the validation and are secured free from mental suggestion, a condition not at all fulfilled in the office of the "Vitosophist," there is no evidence of valid correlation. We believe that the system would be no better when used for industrial purposes.

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Measuring Leadership

By Elizabeth H. Morris, New York State College for Teachers

To estimate personal fitness for various occupations demanding leadership is a task of such importance that in spite of its complexity and difficulty it challenges scientific effort.

Fitness for specific lines of work is often conditioned largely by personal characteristics. Measures of the fundamental trends of personality and of such characteristics as accuracy, assurance, etc., should be viewed as parts of a composite estimate of the individual instead of being used separately.

A technique employed in detecting the kind of leadership which contributes significantly to success in teaching has shown that the following kinds of measures are useful: direction and degree of feeling, typical social attitudes, tactfulness in comment and action, and insight and social judgment. These traits are measured indirectly as well as directly, and results scored in a differential rather than descriptive fashion. The scores may be combined in a profile rating chart which offers possibilities for scientific study of individual differences.

A STUDY of personal characteristics significantly related to success in teaching furnishes not only specific suggestions with reference to fitness for that profession, but also some principles and hypotheses useful in determining fitness for other lines of work as well. This article gives some such suggestions which have been developed from the writer's investigation and measurement of leadership and related characteristics.¹

The question, "How can we make

the wisest selection of candidates for a particular kind of training?" presupposes the more fundamental questions: "What kind of person is best for this line of work?" "How can we measure degrees of such suitability?" Even the effort to name the kinds of persons best adapted to certain activities throws us back to another problem, that of making a satisfactory classification of personal characteristics. Thus the first general suggestion is: Develop a workable analysis of personality.

Such descriptive terms as *industrious*, *lazy*, *dependable*, *irresponsible*, *resourceful*, *tolerant*, and so forth are ambiguous. (Cf. op. cit. pp. 7, 8). For example, does resourcefulness mean quickness to respond to a situa-

¹ For details concerning "Personal Traits and Success in Teaching" see the author's book of that title published as Contribution to Education, No. 342, 1929, Bureau of Publications, Teachers' College, Columbia University.

tion, or ability to make a variety of responses, or is it a combination of both? Is the tolerant person desirably open-minded or undesirably "spineless"? Surely we need a definite conception of what we are trying to measure before we can devise satisfactory techniques for measuring it. A second suggestion, therefore, is: Have a definite and objective standard of the trait to be measured.

The idea of a desirable kind of person for certain work implies a combination of characteristics rather than single separate factors. A person is not the embodiment of one trait but the blend of many. If these blends of traits constituting the make-up of different individuals are to be understood scientifically, we must consider a third principle, namely, the components must be relatively distinct and must be measurable both as entities and in combination. For example, suppose that in trying to find the differences between good and poor teachers we agree that both tact and insight are important assets of good teachers. In our effort to allow for individual differences, yet to keep constant the essentials for success, we are faced with such questions as: How much do tact and insight overlap? How much do they influence each other? Probably in attempting to measure one we are inevitably making some estimate of the other. Our result is therefore not as clear cut and valuable as if we had the three things already implied, namely: (a) Better Standards of Success, i.e., knowledge of what tangibly constitutes good and poor teaching; (b) better understanding of the fundamental factors of per-

sonality or total human make-up; (c) a working list of distinguishable traits which can be measured both individually and as blends; (d) also a clear grasp of what various possible combinations of these traits constitute the desirable kinds of people; (e) an understanding of how characteristics of good teaching are related to the fundamental characteristics of people; and (f) some understanding of how much the important factors may be developed or on the other hand to what extent they must be present to start with. For example, can a person who seems to lack initiative be educated so as to acquire it? Is coöperativeness inborn or acquired? (Cf. op. cit. p. 61)

Though work is needed on each of the above problems, the following points may be taken as a working basis:

Fundamental trends of personality are probably better expressed in such terms as intellectual make-up, emotional characteristics (including intensity, breadth, and stability), and drive or self-expression tendency, than in such traditional terms as perseverance, accuracy, integrity, etc. (Cf. op. cit. pp. 8, 9)

A composite measure should be used rather than any single determiner of fitness, since it provides for recognizing both the uniqueness of individuals and the characteristics common to all who succeed, in contrast to the characteristics of those who fail.

The popular conception of the value of a balanced personality is corroborated by the fact that individuals showing similar ranks in various kinds of measures show a consistent tend-

ency to get along better than those persons who rank very high in some respects and very low in others. (Cf. op. cit. pp. 57-58)

The person who succeeds notably in any given line of work may well be considered a leader in his field, and it is such a practical form of leadership which we probably should try to measure rather than an abstract entity, "leadership" in general. (Cf. comments on industry and persistence, op. cit. p. 11) It is useful to think of the social implications of such leadership as is especially valuable in the profession of teaching. This profession puts a premium upon the ability to inspire others to fruitful activity. Analysis of such ability (Cf. op. cit. Ch. III, especially p. 10) suggests that for determining any form of leadership it is valuable to try to discover the following:

1. *Definite likes and dislikes* concerning objects of interest in the field considered. For example, reading is a considerable activity in a teacher's life. Does the person being considered like reading or not? Also, how intense is the liking or dislike? The technique of finding out about likes and dislikes may be carried out through forming a list of items concerning attitudes, ranging from "like very much" through "like," "neither like nor dislike," and "dislike" to "dislike much." The markings of such a list give a scorable estimate of the individual's expression of direction and degree of feeling. Such a list (formed from the suggestions of Barr, Freyd, and others) was used in the writer's Trait Index I, designed to supplement

intelligence tests, health ratings, and other measures in selecting candidates for teacher-training. (Cf. op. cit. p. 14)

2. *Characteristic social feelings.* Some people regard as amusing a situation which others, even in the same position, consider embarrassing. Such difference in feeling is indicative of individual differences which may be of considerable importance in determining fitness or unfitness for lines of work wherein such situations are likely to arise.

3. *Tactfulness in comment and action.* Though we may not know completely what constitutes tact, we can unhesitatingly designate some comments or acts as more or less tactful than others under given circumstances. Thus by describing situations typical of professional problems, and by mentioning various possible responses, we have some possibility of measuring different amounts of tact for certain kinds of situations.

4. *Insight and social judgment.* Probably these characteristics are among the most essential for leadership in teaching. While they seem to correlate more closely with intelligence than does tact, they are to be distinguished from intelligence. Insight probably suggests less feeling-tone than does intuition, but insight and intuition both imply a relatively unanalyzed though correct interpretation of more than overt aspects of social relations. For instance, the individual who realizes in how far the following statement is true, "What pupils learn depends on the teacher more than on themselves," grasps the true meaning of some school situa-

tions. He may have this grasp without going into all the "whys" and "wherefors," and this grasp encourages fortunate attitudes.

5. *Complex social attitudes* as evidencing initiative or its lack, aggressiveness, timidity, and so on.

The writer had these five features in mind in constructing her Trait Index L, as more fully described in "Personal Traits and Success in Teaching," pp. 13-18. Use of that Index brought out the possibilities of modifying it and applying its techniques in the measurement of leadership for lines of work other than teaching. (Cf. op. cit. pp. 56-60) The difficulties of scoring and the importance of securing measures of both the separate aspects and the blend of factors in personalities led to two further principles:

(1) Score in a way to *differentiate* between the promising and unpromising candidates. The way in which it is possible to do this is too complex to explain here, but the possibility and value of such "differential" (rather than "descriptive") scoring is explained in pp. 19-26 of the study mentioned.

(2) Combine total score, indicating general rank in leadership of the type measured, with scores on separate sections to secure measures of significant individual differences other than those of general rank. Such combination is most convenient in a profile summary such as the writer has described in her Teacher's Handbook published by the Public School Publishing Company of Bloomington, Illinois to accompany their issue of

"Morris Trait Index L."² The profile summary is constructed on the plan of plotting decile ranks which an individual attains in the various kinds of measures used.

This profile summary furnishes data which are valuable for further interpretation. For example, high average of ranks in the various measures is a good sign; some consistency in the rankings in the various measures is an advantage, great discrepancy a disadvantage; moderate degree of some traits (such as emotional intensity, assurance, etc.) is probably more desirable than extreme degree; for some traits, variations within a certain range are not significant but outside of this range are important. For example, rank in the sixth decile in accuracy seems to mean little more than rank in the fourth decile, but a ninth decile rank is a definite asset whereas only a first or second decile rank in accuracy is a real handicap.

Profile charts are summaries of many kinds of measures, too complicated to describe fully within the scope of this article; but studies already made show that they are very useful ways of combining measures of various aspects of personality, and that they also suggest important principles for further scientific investigation of personal traits.

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² It might be stated that sections I, II, III, IV, V, and VI of this revised issue of Morris Trait Index L correspond respectively to sections I, IIB, IIC, III, IV and V of the original Trait Index described in "Personal Traits and Success in Teaching."

Skill and Specialization

Part II. The Significance of Skill

BY MILDRED FAIRCHILD, *Bryn Mawr College*

This analysis of the skill of the workman in relation to the specialization of his work is continued from the June number of the PERSONNEL JOURNAL. Part I dealt with The Nature and Measurement of Skill.

1. TESTING THE TECHNIQUE

WORKERS' SCHEDULE⁴²

THUS far we have discussed the technique employed in this study for evaluating skill, and the determination of a skill-index for each of the 75 workman studied. It then became necessary to test the technique by relating the skill-index established to certain other characteristics of the workmen. The study collected evidence telling of the significance of skill in relation to the work done and to the social and psychological life of the workmen performing it.

Reference to the workers' schedule which was used will show how case studies were made of each workman. Information regarding them was grouped into three divisions. The first division concerned (a) the physical conditions of the job, (b) the trade history of the workman,—i.e., his trade training and experience,—and (c) his social background, namely, his

nativity, education, type of home and leisure-time activities. In the second division, the investigator rated the workman on (a) his habits of work, (b) his skill at work, (c) his adjustment to unusual demands in work, (d) his attitude toward his work, and (e) his attitude toward the management of his plant. The third division sought to discover from the workman the source of his satisfaction in his work, in an effort to find out something about the relation between his skill and his satisfaction. The information in the first division of the schedule was based on the workman's statements to the investigator, supplemented by the employment records. The ratings in the second division are the investigator's ratings based upon her observations, supplemented by the opinion of foremen and management. The ratings of the third division were the investigator's, based upon the workman's statements as drawn out in interview.⁴³

⁴² The workers' schedule appeared as Appendix B to Part I of this paper in the June issue of the PERSONNEL JOURNAL.

⁴³ A uniform method of interview was impossible, because of differences in firm policy. In two plants it was carried on within the factory at the convenience of

As to some of the things these case records showed, sixty-two of the 75 men were American born. The nativity of the workmen apparently had no relation to their skill attainment; nor did marital state, size of family, type of home, or leisure-time activities show any relation to their skill attainment. Obviously the men lived, married, had children and adopted certain types of recreation with no definite relationship to the work they did. Tables XIV, XV, and XVI in Appendix D give the details of these points.

Education, on the other hand, (that is, the amount of schooling which a workman had received before going to work) his trade experience and his wage showed, in general, a certain relation to his skill attainment as measured by the skill-index. So also the ratings on production standing and skill, as judged by the management, habits of work, attitudes toward work and management showed variations with the skill-index which merit attention. Tables VII to XI in Appendix D give the detail of these ratings in the four plants.

METHODS OF RATING

The homes of the men were observed on four counts: type of house, (single,

workmen and investigators, both during work and in rest periods. In one plant it was accomplished by visits to the workmen's homes. In one plant, both types of interviews were possible and were obtained, with, incidentally, the most complete and satisfactory results. Factory interviews were found necessary for the best skill analysis, but insufficient for personal information. Home interviews proved better for the latter but difficult for the former. Both types of interview throughout the study would have given better and more complete results.

duplex, row or tenement), space (number of rooms per person), condition of repair, and the existence of a yard or garden. A simple rating scheme was worked out by which each home could be graded and the grade reduced to 100 per cent. The type of house was graded primarily on a basis of light and air exposure, one point for a row or tenement, two points for a duplex, and three for a single house. Space was rated one point for less than one room per person, two points for one room per person or one or two rooms in excess, and three points for more than two rooms in excess of the number of persons. Children under five years were counted as one half a person. A total of 12 points thus constituted 100 per cent.

With the exception of skill, the ratings on the workers' schedules were all quite simple. Production standing was rated as above average, average or below average, as shown by the records of output or the rating of the management. Habits of work were rated on a basis of orderliness, system, plan and regularity in work and attendance, as judged by the investigator over the period of the study and as checked by the management. Adjustment to the unusual in work was rated on a basis of adjustments to rush work, overtime work, night work, an unfamiliar job and a new process. Attitude to work was rated according to the workman's attitude toward his regular operation, toward the regular set-up of his machine, and toward variation in either; upon the basis of his confidence in his ability to handle the work, of his sense of security in employment, and of his satisfaction in work as judged by his satisfaction in

job, wage or conditions of work. Relation to management was rated according to the workman's response to suggestion, acceptance of criticism and readiness to cooperate with the management. Characteristics rated were given points one, two or three, according to whether they were counted as poor, average or good, and the total reckoned on a per cent basis.⁴⁴

The information sought by the workers' schedule regarding skill, or perhaps better, regarding craftsmanship, was classified under technical knowledge, manual dexterity, sensitivity and personality. Technical knowledge includes the workman's technique of handling machine, materials and tools, and such principles of mechanics as are essential to the machinist. The word knowledge has been used for lack of a better word. It must be understood to include the muscular and kinaesthetic adaptations and appreciations which are an integral part of knowing how to handle the machinists' techniques, tools and materials. It cannot be considered a purely mental function. A machinist's knowledge of materials necessarily includes not only any book learning he may have on the subject, but what might be termed a muscular appreciation of the speeds and feeds appropriate to the strength and resistance of the material he works. The two aspects are hardly separable. A better term, and one more accurately

describing the characteristic sought would have been habituation. Manual dexterity would have been more accurately termed muscular dexterity since it concerns not only the hand but all the muscular faculties used. Sensitivity means the developed sensitivity of eye, ear and touch actually used, irrespective of native capacity in that regard. Finally, certain personality characteristics were included as a part of the total industrial skill. Judgment, readiness for responsibility in tackling work, such as shows itself in the handling of materials and tools, planning either before or as work proceeds, and the like, were counted skill factors of an intangible but integral character.

All these factors, again, were rated one, two and three according to their grade. And quite arbitrarily total values were given each factor in the proportions of: technical knowledge, 40 points; manual dexterity, 21 points; sensitivities, 9 points; and personality, 30 points—a total of 100 points.

Disagreement with this rating, and with the factors included in it, are legitimate. It was attempted simply as an experiment within a new field. The judgments were made after the operations had been observed and charted, but before any therblig-skill-averages had been computed. Each workman was discussed with the foreman and at least one other member of the management—employment manager, member of the time study department, or superintendent—whose opinions were used to check the ratings. Comparison across the entire range of work in all the factories was attempted since the object of the ratings was partially an inter-factory comparison. In

⁴⁴ Attitude ratings were based upon the investigator's judgment resulting from interview and observation over the period of the study. No objective method of evaluation was found. The judgments were seasoned ones, however, and the result of careful analysis.

other words, all of the selected men in the four plants were compared in the skill rating.

The relations between these various factors and the skill-index were shown by a series of correlations. These were made between the various skill-indexes and the ratings on production standing, skill, habits of work, attitude to work and relation to management; and between the indexes and the education, trade training and average weekly wage. Table IV gives the correlations made and their probable errors.

SKILL-INDEX AND PRODUCTION STANDING

Between the skill-index and the production standing of the workmen the correlations on three plants are positive and rather high. But in Plant A they are insignificant. The exact reason for the lack of correlation in Plant A is not clear. Possibly it was due to the nature of the work which was largely repetitive. Such work would not lend itself to analysis on the basis adopted for the study. Skill, as defined and charted, may not include the factors of primary importance to high output on repetitive tasks. Speed of work and steadiness at work, for example, may be the qualities essential for any man to maintain a high production in repetitive work, and the skill-factors included in the simo-skill-chart as now developed may be secondary in the requirement. If that be true, the skill of Plant A would seem to be little more than a high type of proficiency and not skill at all. Conceivably the low correlation between the skill-index and production standing in Plant A may itself be highly

significant. It is perhaps characteristic of a mass-production shop that a man of high production is not necessarily a man of high skill, at least as skill is defined and analysed in this study.

THE SKILL-INDEX AND SKILL RATING

In comparing skill-indexes and skill ratings, Plants B, and C show high correlations, A and D low correlations. Correlations between the skill-index and skill rating might of course be expected. It must be remembered that the two skill evaluations are not concerned with identical facts. The skill rating estimates and grades the skill which it was thought the man possessed, while skill index grades the actual skill shown on an operation. As it happens the skill rating includes in far larger proportion than does the skill-index the factors which Pear⁴⁵ would term the "accident" as opposed to the "propria" elements, and which Bezanson⁴⁶ would term the "accidental" factors of skill. Knowledge and personality factors enter into the skill rating which are distinct from muscular skill, although in the opinion of the writer they are so closely allied as to be integral to performance. These factors do enter into the charted skill of performance but to a lesser degree. A consequent variation between rating and index is quite reasonable, and might be expected. It might well, also,

⁴⁵ See T. H. Pear, *The Nature of Skill. Journal of the National Institute of Industrial Psychology*, October, 1928, vol. IV, pp. 193-202.

⁴⁶ See Anne Bezanson, *Skill in Industry. Quarterly Journal of Economics*, 1921-22, vol. 36, pp. 626-645.

be most apparent at the extremes of the range represented by Plants A and D, inasmuch as the skill ratings both vary less from man to man within the plant than do the skill-indexes, and their means vary more between plants than do the mean skill-indexes, unweighted in accordance with the variation in skill factors as the latter are. The low correlations of Plants A and D, therefore, may be significant of the two extremes of the sampling, or they may be due to a concentration of low skill ratings in Plant A and of high skill ratings in Plant D. Of course, also, they may be evidence of an unsatisfactory skill rating. Conceivably this more general and subjective estimate of the workman's skill abilities might differ fundamentally from the skill-index with its greater flexibility and more specific skill evaluations, also with its limitation to skill on the job at a specific time.

THE SKILL-INDEX AND HABITS OF WORK AND ATTITUDE TOWARD WORK

The meaning of the comparisons between the skill-indexes and the ratings on habits of work are more readily understood if one refers to the frequency tables, as they are also between the skill-indexes and the ratings on attitude toward work and on relation with the management. (Tables XX, XXI, and XXII, Appendix D.) Apparently there is some relationship between the skill-indexes and habits of work and between the indexes and attitude toward work. The habits of work of all the men tend to be rated as high, however, especially in Plants A and D.

The man who is a skilled worker may

not necessarily be neat, orderly and systematic in his work, but in Plants A and D at least, all of the workmen, whatever their skill, tended to be so. Moreover, even in Plants B and C the correlations are somewhat lower than in the previous instances, and a study of the cases reveals a like tendency for all workmen to be rated rather high in this regard. Whether the plants all incline to select men with good habits of work, or to train them into good habits whatever their natural aptitudes, or whether the selection of the investigation favored the neat and systematic workman, is hardly determinable.⁴⁷

A somewhat similar factor enters into the relation between the skill-indexes and the men's attitude toward their work. In Plant D most of the men were rated as having a favorable attitude toward their work. A study of the cases on attitude, however, shows what every psychologist would expect, that there are men with a low skill-index, particularly when reckoned on a factory basis, whose attitude toward their work indicates a fair degree of satisfaction. This subject is discussed a little later where the question of skill and its relation to satisfaction is considered more fully.

THE SKILL-INDEX AND THE RELATION OF MAN TO MANAGEMENT

Relation of man to management seems to follow to little or no degree the skill of the workman, insofar as the former was evaluated by this study. In all four plants, the relation of the men with the management

⁴⁷ The writer has no memory of such selection.

tended to be rated as high. Plant A had more low ratings than any other. More than half the selected men in each plant were placed in the highest groups. Little of the variation which occurred was related to the skill of the workman as evaluated by the skill-index. A study of the case record indicates rather that the low ratings were due primarily to personality difficulties. Possibly the workman disliked the foreman, or he was distrustful of the time-study policy or indignant over the treatment of a works council. Occasionally he exhibited a sullen or suspicious disposition in general. Sometimes he found it difficult to accept a foreman's suggestions and disliked what he regarded as interference or carping criticism. In some of the more skilled men there was a sense of being driven or of what they regarded as a lack of appreciation for the niceties of their work. No particular effort was made to analyse these difficulties or to study them in detail. So far as the data of this study are concerned, however, such difficulties proved not to vary with the skill of the workman.⁴³

⁴³ Quite possibly the selected men do not represent a typical group in this regard, in any of the plants. Undoubtedly men who were coöperative by nature were in many instances chosen for observation and study, since these were the men most readily interviewed by the investigators and least disturbed by their presence while at work. Such men might be expected to rank high in their relation with the management and might, therefore, constitute a somewhat selected group in this regard. Moreover, even with long interviews and continuous association, and the resulting discovery of many hidden and perhaps only half-conscious reactions, evaluation of this relation

SKILL, EDUCATION AND TRADE TRAINING

According to the data, skill does not vary with schooling or with trade training. If these data may be trusted the attainment of skill is dependent on some factors other than schooling and trade training, but a study of the cases indicates that in the higher grades of skill, education and trade training are more often than not associated with it. And the relation is more definite in the case of general schooling than it is with specific trade training.

It is evident that a man without a high grade of schooling and who has not served an apprenticeship may attain the higher ranks of skill. Nevertheless the cases show that in Plants C and D at least, the more skilled men ordinarily have reached a higher grade of school and have had the apprenticeship training, in whole or in part, although less skilled men also may have had it and with less effect. (See Tables XXIII and XXIV Appendix D.) Neither schooling nor apprenticeship training seems to assure a man of a high grade of success, nor does the lack of either bar him from attaining it. If these figures are significant, they show that in work requiring the higher grades of skill, apprenticeship, and at least a complete elementary education, are more often than not associated with the more skillful workman.⁴⁹ The inference for vocational guidance is obvious.

was probably too superficial to be regarded with entire confidence. It may be that a more specific and carefully devised rating system might yield quite different results.

⁴⁹ In order to make a statistical comparison, the data on trade training had neces-

SKILL AND WAGES

Finally, skill as evaluated by the skill-index seems to have a significant relation to wage; but in all factories, especially in Plant A, (See Table XXV, Appendix D) it does not seem to be the only factor in wage determination even within one plant. A study of the mean skill-index and the mean average weekly wage between factories, as estimated over a period of three months,⁵⁰ shows that progression is comparable between the two in Plants B, C and D, but that in Plant A it is not comparable. The suggestion is that in plants requiring similar skill, the degree of skill needed affects the wage paid. But where a lower mean skill is required (as in Plant A) other factors enter, such as the necessity for a competing wage. In all cases, apparently, wage measures in part something besides either skill or output. And since it is recognized that precedent, market rates and other factors do enter into the determination of wage, the relation brought out here seems to be reasonable.

sarily to be reduced to a grading system. No training other than that picked up at work was given a grade of one point; training in another trade, on the assumption that transfer of some kind of skill might occur, was given two points; an upgrade or a so-called vestibule type of training in the present trade, three points; a partial apprenticeship in the present trade four points; and a completed apprenticeship in the present trade five points.

⁵⁰ Wage included full-time earnings plus bonus on production. It did not include any overtime earnings.

CORRELATIONS AS TEST OF VALIDITY
AND EVIDENCE OF RELATIONSHIP

In making such a series of comparisons and correlations, one is confronted with a dual problem. In the first place, the reliability of the data must be considered. Especially in a new field, where one is necessarily experimenting with new methods of work, it is essential to study certain facts of association in order to test the validity both of the method and of the data which it yields. Significant correlations covering a considerable number of cases are regarded commonly as evidence of validity, and the evidence, of course, increases with the number of cases. Only after the method and data are considered valid, can the significance appear of the relationships which the associations and correlations bring out.

This duality handled simultaneously is never quite satisfactory. Yet simultaneous handling has been necessary in much sociological and psychological study to date. Anything like confidence in the results has come about, therefore, only with development of the study and increase in the numbers of cases accruing to it. The use of intelligence testing, for example, either as to method or as to results obtained, won general confidence only with repeated successes covering large numbers of cases.

In this instance the correlations in the opinion of the writer seem to establish the validity of the method and the reliability of the data which it yields. They indicate that the skill-index based upon the simo-skill-chart

and derived from the therblig-skill-average of the workmen offers a comparative skill evaluation between workmen which appears to be both practicable and trustworthy. Especially the correlations between the indexes and production standing and wage are significant, since both production standing and wage were objective ratings. At the same time the whole series offers illuminating evidence of the relationships between skill and various habits, attitudes and experiences which is far from negligible.

Throughout the study of the correlations Plant A has shown individual tendencies distinct from the other plants. Correlations which have appeared for the other plants have repeatedly failed for Plant A. At least two reasons for this suggest themselves. Either the method of the skill-index, or rather the analysis of skill used to form the index, is not so suitable to the type of proficiency needed and utilized in Plant A as it is to the skill needed in the other plants, or the application of the method was not so exact in Plant A as it was in Plants B, C and even D. The fact that frequency tables tend to bring out comparable relations which the correlations obscure might incline one toward accepting the second alternative. On that interpretation the indexes as determined, even in Plant A, might in general be considered significant, their trends and averages suggestive, even though under specific analysis and comparison, such as that of the correlations, they failed to give statistical evidence of their accuracy.

The other interpretation, however,

is quite open to consideration and acceptance. As previously stated, the proficiency which turns out quantity goods in a mass-production shop may very possibly be primarily one of speed of movement and steadiness of work, combined with accuracy in working. Judging from the therblig-skill-averages attained by the workman of Plant A, some skill, as evaluated by the skill analysis, also must be needed, but with the exception of accuracy of movement, it may be a secondary requirement. In that event, very much the degree of association which the data here have revealed should be expected.

The tendency of Plant D to show similar failures of correlation, even though usually for an apparent and a different reason, may support either one of these interpretations for Plant A. Only further research can decide the issue.

For Plants B and C, on the other hand—and with production standing, education and wage, for Plant D also—the correlations and comparisons have both verified the use of the skill-index, as developed here, for skill evaluation, and have at the same time produced noteworthy evidence of the relationships to be expected between the workman's skill and certain other factors in his personality and his experience closely associated with it.

The method requires much development and improvement throughout, but its scheme is evidently useful. The information it has produced already is significant, as are also the relations, which it has indicated as probable between skill and output, skill and wage, skill and education and

trade training, and skill and the attitudes of the workmen.⁵¹

⁵¹ All relationships which have been considered significant have been tested by

Hart's tables on *The Reliability of a Percentage*. See Hornell Hart, *The Reliability of a Percentage*, *Journal of the American Statistical Association*, March, 1926, vol. 21, pp. 40-46.

2. SKILL AND SATISFACTION

A CONCEPTION OF SATISFACTION

The word satisfaction, like the word skill, is broad in concept and has long been used without precision. To attempt to analyse it, or to base any discussion upon its observation may seem to many persons unwise, if not preposterous. Satisfactions are, it will be claimed, subjective estimates only of a man's reactions to his environment and experience; they are therefore closed to analytical observation and discussion.

An attempt to evaluate satisfaction in any such specific terms as this study has evaluated skill, crude though the method and result of skill evaluation are, would seem to the writer at this point impossible. But the workman's satisfaction, both to the sociologist and to the psychologist, and it may be also to the industrial engineer, is so closely allied to the question of his skill that some attention need be given to it here, even though a thorough analysis is not possible.

For the purposes of this study, satisfaction has been considered to mean *a sense of actual contentment or enjoyment coming to a man from a particular experience*. A sense of satisfaction in a particular object, activity or condition may be interpreted to mean a pleasurable sense of fulfillment, which, however slight, is an active element in a man's thought or experience. Mere lack of discontent, or in-

difference, will not be included in the meaning of the word here.

THE RATING ON ATTITUDE TOWARD WORK

A few pages back, the rating of the workmen's attitude toward their work, by a grading of low, average or high, was discussed. The determining factors were: his attitude toward the operation he performed, or the set-up, or variation in either; and whether he felt satisfaction with his wage or with his surroundings. A much more detailed analysis might have been worked out. In a study concentrating upon or centering around the subject of attitude or satisfaction, such detail would have been essential. But even with the cursory nature of the rating, the resultant grades register an attitude evaluation which is pertinent.

A study of the ratings on attitude toward work shows the mean grades for the four plants to be; for Plant A, 63.5, for Plant B, 80., for Plant C, 82.7, and for Plant D 84.3. (See Table VIII, Appendix D.) These figures indicate that in attitude toward job, wage and surroundings, the men in three of the plants ranked very closely together, but in one considerably lower. In two of the plants, it will be remembered, the ratings correlated positively with the skill-index of the workmen, that is, in Plant B at .48 and in Plant C at .79. In Plant A the correlation proved to be insignificant

(.23). In Plant D, also, the correlation proved insignificant ($-.13$). But a frequency table showed that all workmen tended to rate comparatively high in attitude.

SATISFACTION IN JOB, WAGES AND CONDITIONS OF WORK

A more detailed rating was attempted during the course of the investigation.⁵² Here the object was to discover the workman's satisfaction with his (1) job, (2) his wage and (3) his conditions of work, by locating the source of his satisfaction in each. A grading of A, B or C was given him according to the number of sources (as listed in the workers' schedule) which gave him satisfaction in job, wage, or conditions of work. But no effort was made to evaluate the degree of satisfaction due to any source.

The sources included under job were the physical pleasures of activity, posture, rhythm and the use of trained muscles; the mental pleasures proceeding from the use of capacities, from the ability to fulfill requirements, and from the stimulus to learning or invention arising from the work; and the emotional pleasures, if they may be so termed, arising from the quantity, quality or beauty of the product, from a sense of usefulness, from successful competition, and from prestige. The sources included under wage were the workman's power to supply the necessities of life for himself and his family, to acquire certain luxuries in a comfort standard, and to be able to advance

himself or his children in the rising social scale. The sources included under conditions of work were the status of the physical plant, its surroundings and facilities, its recreational, educational and social opportunities, the security of employment and opportunity for promotion, the relations with foreman and management and the relations with fellow employees.

Where the investigator found two or less than two sources of satisfaction in the job for a workman, his satisfaction on the job was graded as C; if she found three or four, it was graded as B; and if over four, as A. One type of source was not considered superior or inferior to another. Where the investigator found that the workman considered the wage enough only to provide his family's or his own basic needs, his satisfaction in wage was graded as C; if he thought it capable of supplying certain luxuries besides it was graded B; if he counted it as enough also to advance his children or himself—for one may safely count that as an ultimate aim of all American workmen of this type—it was graded A. Likewise, under conditions of work, the number of sources of satisfaction graded the men into the three classes. Two sources or less were graded as C, three or four were graded as B, and over four as A. As stated above, the resulting grades are purely quantitative, and not at all measures of the degree of satisfaction in any source.

The results of all estimates appear in Table XII, on page 166. Conceding that these figures do actually indicate the sources of the workmen's satis-

⁵² See Part C of Workers' Schedule, which appeared as Appendix B to Part I of this paper in the June issue of the *PERSONNEL JOURNAL*.

factions, they are very interesting indeed. In satisfactions arising from the job, in Plant A, 3 out of 25 men belong to the A group, 7 to the B group, and 14 to the C group; in Plant B the distributions are nearly equal; in Plant C all 10 men, and in Plant D 17 out of 20 men, belong in the A group. In wage satisfactions, at Plant A, 19 of the 25 men belong in the B group, at Plant B 8 out of 14 men belong in the A group, at Plant C 7 out of 10 belong in the C group, and at Plant D 12 out of 16 were graded A. In satisfactions arising from conditions of work, Plant A men are graded 13 in Grade B, and 9 on Grade C, Plant B men 12 in Grade A, Plant C men 9 in Grade A, while Plant D men are distributed nearly evenly.

A study of these figures indicates that the selected workmen at Plant A tend to find their main satisfaction in their wages, some in conditions of work, and very few in the job. The selected workmen at Plant B find their satisfaction primarily in conditions, with wage and job supplementing. The selected workmen at Plants C and D, on the other hand, find their satisfaction primarily in the job, with, at plant C, conditions ranking a close second and wages ranking low, and at Plant D wages ranking second and conditions distributing evenly.

SKILL AS THE FIRST SOURCE OF SATISFACTION TO THE WORKMAN

Inasmuch as both the mean and median skill-indexes, as shown previously, increased from Plants A to D, (the means of the S. I._s varying from 67.2 to 108.5 between Plants

A and D respectively⁵³ the conclusion seems justified that where skill exists to a considerable degree it tends to become the first source of satisfaction to the workmen. Where it exists to a lesser degree, it tends to drop out as an active element. Satisfaction in conditions of work or in wage becomes predominant only where satisfaction in skill has materially decreased.

But whether or not lack of skill becomes an active source of discontent seems to depend upon individual temperament and make-up. Among workmen doing repetitive work there was a certain black-eyed, quick-moving Scotchman, one of the more skilled men in the plant, who rebelled at the repetitive nature of his work. The investigator found him eager to read and to talk, liking Ibsen's plays and wanting to discuss them, and doing so with a clear-headed, native critical ability delightful to see and hear. Life would be intolerable but for the evening's recreation he claimed, and he saw no chance of advancement or change in his work. Then there was a German, a graduate of the University of Heidelberg, who operated a turret lathe, performing an operation the cycle of which was complete within a few minutes' time. He had been doing the same work for four years and did not expect to change it. He found little enough in his work to interest him, and for recreation no companions available who were congenial to his tastes. A third workman, this time American, somewhat comparable to the other two, had a native talent for painting, sketched in water colour at

⁵³ See Table I, page 51, June issue of the PERSONNEL JOURNAL.

every opportunity and glowed with interest only when discussing it. All three of these men rated high in skill and all three showed a maladjustment to their situation which, if not tragic, was at least thought-compelling and sobering to the observer.

Against these cases range those 3 out of 25 workmen in Plant A, who apparently liked their work thoroughly. The most striking of these was a man whose job was repetitive beyond any others, who operated one of the machines requiring the least skill of any among the selected tasks. He had completed the eighth grade in school before beginning work, which means that his schooling was above the average among the selected workmen in Plant A. Nevertheless, easy going, cheerful, talkative and humorous as he was, his job suited well his tastes and ambitions. If it ever wearied him, and there was no evidence that it did, he had always the foreman or a fellow workman to chaff. He found in the investigator an endless source of amusement so long as she lingered within or near his sight or hearing.

These four cases were outstanding but they were also typical of the problem among the men performing repetitive tasks. There were workmen among the most skilled of these who exhibited certain active dislikes for some phases of their work. There were others with far less skill development who found it quite satisfactory.

The question of intelligence and its relation to success and contentment in repetitive work naturally arises. Miss Isabel Burnett⁵⁴ made an in-

teresting study of this subject, in which she reached the conclusion that high intelligence yielded less success and less contentment in repetitive work than an average intelligence, especially if it was combined with a less erratic disposition. In a repetitive task continued over an eight-week period, the workers ranking high in intelligence tests and erratic in an adding test failed to equal the output of a worker ranking lower in the tests. They also suffered more from the monotony of the task. A worker, on the other hand, showing a subnormal grade in the intelligence test, although exhibiting a surprising improvement in her work during the eight weeks of the experiment, was unable even at the finish to compete successfully with the other three. Also she found the competition a constant source of annoyance.

In the present study, no intelligence tests were thought possible.⁵⁵ The correlation of intelligence quotient and skill-index, or the comparison of intelligence and satisfaction in work, are therefore out of the question at the moment. Careful observations, however, seem to indicate agreement to some extent at least with Miss Burnett's conclusions.

The criticism commonly uttered that repetitive work produces general discontent in workmen did not, in any such sweeping terms, receive support from these findings. There were men with low skill-indexes who found more sources of satisfaction in their work than others with high ones. There were men doing repetitive work who

⁵⁴ Isabel Burnett. *An Experimental Investigation into Repetitive Work*. Industrial Fatigue Research Board Report, No. 30. London, 1925.

⁵⁵ The workers' schedule originally contained a section attempting to evaluate mental qualifications, but it was abandoned as impracticable and useless.

found more sources of satisfaction in that work than others doing a much more varied type of work. At the same time a study of the cases indicates that the men who expressed satisfaction in their work were for the most part, men who were successful, from the standpoint of their skill-index or production standing, in their own grade of work. The first and most obvious comparison which any man made, it would seem, was between himself and others doing the same kind of work. Success in what he did appeared to be satisfying to many a person when what he did was very simple, in comparison with what others at no great distance from him did. An evaluation of success on the job therefore, might conceivably correlate more positively with a skill-index formed on a process base than with one formed on a factory base.

But the case study indicates also that an assumption of a correlation in either event is not justified because the reverse of the above proposition will not prove true. The man who likes his work may seem to be one who does it well, but the man who does work well may not like it also. According to the findings of this study, at least one other element is related to that result. The workman apparently must respect his work as well as his performance of it to find it a satisfactory outlet for his energies. And that respect evidently varies with his individual experience and concept of himself in relation to it.

It is significant that the maladjusted persons found among the selected workmen were doing repetitive work. There were workmen interviewed

among those engaged in more varied work who found causes for indifference or discontent in their work, but none who spoke contemptuously of it. One may argue that repetitive work utilizes successfully certain maladjusted persons unable to perform satisfactory the higher types of work, or one may argue that the nature of repetitive work is itself productive of such maladjustment. Possibly both propositions have an element of truth in them. The fact remains that the repetitive work is obviously unsuited to men such as the three described above, although the responsibility for their maladjustment and any unhappy results of it probably belong to society as much as to industry.

The conclusion from both the statistical analysis and the case study of this material is that where skill is given play it becomes in the workman developing it much the greatest source of his satisfaction. Satisfaction in wage, and satisfaction in the conditions of work supplement it or not as the case may be. But definitely they tend to be counted as subsidiary. Where skill is not given play, satisfaction in wage or conditions do predominate in the workman's mind. If the man's capacity or training are suited to what is required of him, the lack of opportunity for the use or development of skill may be no drawback to him. The physical activity, or rhythm, or the quantity of product he can turn out, or occasionally the sense of power over his machine may even give him an active pleasure in his job. If his capacities or training have not suited him to it, however, so that he feels himself either superior or

inferior to it, he may or he may not do it well, but in either case he probably finds it a source of driving discontent.

BASIC SATISFACTION FOR ALL WORKMEN IN SENSE OF CAPACITY

A careful comparison of the types of sources of satisfaction found in the job shows no significant variation from plant to plant. In practically every workman, the sense that he can meet the demands made upon him, that he can do the work readily, constitutes the first and basic source of his pleasure in it. After that, the physical, mental and emotional satisfactions are equally distributed. Men upon the same kind of work do not necessarily, or indeed probably, derive their pleasure in it from the same sources. Where one likes the activity and rhythm involved in his performance, his neighbor doing the same work likes the sense of power over his machine or manifests pride in its performances. A tendency toward more sources among the men of Plants C and D than among those of Plants A and B constitutes the only general distinction.

SATISFACTION IN WORK AND HOURS

But satisfaction in the job not only predominant where skill is utilized, but it apparently is great enough to offset circumstances which might be thought a drawback. The plant where the highest per cent of workmen found satisfaction in the job was also the plant where the highest per cent found satisfaction in the conditions of work. This was Plant C. Yet this plant worked the longest hours of any of the four studied. Ten hours a day were not

apparently incompatible with satisfaction in both work and conditions. Undoubtedly other things than the hours of work contributed to satisfaction in conditions. Nevertheless the fact suggests that long hours were not intolerable to these men when the work was skilled.

It becomes a question then whether short hours can be an adequate substitute for interest in work. In Plant B the figures suggest that short hours, along with other conditions, actually became the substitutes for skill in the satisfactions of many men, just as, in Plant A, wages took precedence. The wide range of skill in Plant B, however, makes indications less specific and generalization less safe than for the other plants. The workmen in the upper ranges of the skill-index in Plant B bear out the findings for the men in Plants C and D. In all three plants, where skill comes into play it apparently takes precedence in satisfactions over conditions or wage, even when the last may be a source of active discontent or distress.

SATISFACTION IN SKILL AS AN INCENTIVE TO WORK

Much discussion arises today about incentives to work, their place in developing industrial efficiency, and the various kinds which are effective. Those most frequently suggested involve one form or another of payment or reward: the individual task bonus based on a time study of the job, the group bonus, also based on a careful job analysis, a general high wage, or, profit-sharing and copartnership. All of these are undoubtedly effective when well applied. But the results

of this study suggest that failure to utilize men's capacity for skill development is like failure to utilize the capacity of a waterfall flowing past one's factory doors, or of the coal in one's bins to its fullest extent. It is a waste of a natural utility directly at hand, whose use would be advantageous to everyone concerned.⁵⁶

The keynote of industrial civilization, it has been said repeatedly, lies in its application of power. Until recent years the power developed was primarily mechanical. Today, in order to secure smooth industrial relations between workmen and employers and to attain productive efficiency, increasing attention is being given to human power, especially that of the workman.⁵⁷ Philosophers and social psychologists today talk of the drive to power as a primary element in

⁵⁶ Compare Robert B. Wolf, *Use of Non-financial Incentives in Industry*, *Journal American Society of Mechanical Engineers*, Dec. 1918, vol. 40, pp. 1035-1038.

⁵⁷ Compare H. S. Person, *Bulletin of the Taylor Society*, December 1928, vol. 13, p. 230. Address given before the Taylor Society Meeting.

human activity. The development of skill is closely allied to the application of that native driving force. To develop a skill or technique in any line of activity, whether in music, art, sport, or industry, is to harness a torrent of rushing waters and turn it to effective account. Skill is needed in industry today not simply as a bargaining asset for the workman, nor only to supplement mechanical contrivances which have not yet been perfected to the point where they can do the entire work unattended. It is needed as a fundamental psychological requirement of the workman. And it presents a vast resource, which is now only partially exploited, for increasingly efficient production.

The wise engineer will study how to utilize his available resources to their greatest capacity. And the wise student of industrial problems will study how to reveal those resources in the species and in the individual—because in the last analysis human beings must always be considered as individuals—to make possible their adaptation and preservation.

3. SKILL AND SPECIALIZATION

A COMPARISON OF SPECIALIZATION OF WORK IN THE SELECTED PLANTS

The effect of specialization in industry upon the skill of the workman has been discussed, in general terms, far and wide. But this study has gathered specific data for the purpose of throwing light upon the relation between skill and specialization. A more complete description of the plants

and processes studied,⁵⁸ which will show their differences in organization, product, and process, becomes necessary at this point.

Plant A

The product of Plant A consists of a variety of size and type of deep-groove ball

⁵⁸ A general description of these plants appeared in the June issue of the *PERSONNEL JOURNAL*.

bearings, the inner and outer races and copper cages for which are turned out at this plant and assembled there with balls from an associated firm. Three types of steel, carbon-chrome, molybdenum and low-carbon steel, are used for the races. Goods are produced for a definite market, mostly on order, from standard designs supplemented by designs made at the plant. During slack seasons some goods of the best selling type are produced for inventory to stabilize employment. The demand tends to be seasonal; February, March, April, and May are peak months, June, July, and August slack months. The average value of the total product per month in 1927 was approximately \$400,000. The market extends over the two Americas with occasional orders from Europe and other sections of the world.

Plant A is purely a production plant. Its shop departments are: forging, annealing, bar-turning, automatic-ring-cutting, lathe stamping, hardening, surface-grinding, outside-diameter, inside-diameter and groove-grinding, polishing, assembling and final inspection. It contains in addition a well-equipped laboratory and research department which experiments with and tests out new designs and materials, a fact significant for this study only because it indicates that the product is constantly improved in design and material.⁵⁹

Regardless of the constant improvement in designs and methods, processes at Plant A have been standardized to a considerable degree, and standardized products have brought in machinery with many automatic features, some of which have been invented at Plant A or by its allies.

The work required, from shop employees (therefore), is repetitive in nature, the work cycles are short, the skill requirements are supposed to be low. With the exception of tool-making, where an apprenticeship system is conducted in conjunction with the Metal Manufacturers' Association,⁶⁰ no

training is considered necessary for shop work at Plant A other than that which the workman can readily pick up at his machine on production work. From two weeks to six months are reckoned as enough to bring a man to a point of proficiency, with, in some cases, a longer time for learning to set up the machine for operation. No definite system of promotion exists, and very little promotion occurs. What does occur is based upon merit, reckoned mostly upon output and good workmanship.

Output is the basis of much comparison and judgment at Plant A. Accuracy of work, however, is recognized as an essential element in its production, and careful inspection checks up on this repeatedly.

Plant B

Plant B produces various types of electrical measuring instruments, primarily pyrometers, but other varieties on special order. It manufactures, on order, in part from its own design, in part from designs sent with the order. When orders are low it manufactures somewhat for inventory. The market includes both home and foreign, and the demand is comparatively even. Plant B instruments are outstanding for newness of design and high quality of manufacture.

Little change has occurred at Plant B in recent years in the type of work required. Accuracy of hand and eye are an essential part of nearly every step of instrument making. Such changes as have occurred have tended to increase that requirement to effect an increase in the perfection of the product. By the nature of the product, all emphasis is placed upon accuracy of work not upon output.

Except for the making of certain small, standard parts, automatic machinery has little or no scope here. Certain portions of the regular shop work are comparatively

Board of Education, whereby boys are sent to a Trade School for instruction in shop mathematics, mechanical drawing and trade theory, and to metal-manufacturing plants for their shop work. Plant A had three apprentices in its tool-making department during this study.

⁵⁹ No measure of the rapidity of that change was found, nor of its influence upon the work of the shop employees.

⁶⁰ The Metal Manufacturers' Association of Philadelphia began, in 1926, a system of apprenticeship in coöperation with the

well standardized so that, while repetitive work is not in order, a noticeable similarity in type of work is required of certain workmen. In addition to the regular shop, a so-called laboratory does the wiring, threading and the like, and an experimental shop builds instruments of a special or experimental type in which one workman makes the entire instrument from start to finish. For this study, selections were made from the regular shop only, as the only department comparable to the light-machine shops of the other plants.⁶¹

Apprenticeship was at one time unnecessary for Plant B because a skilled type of machinist was available who came already trained from Germany and Austria. In recent years the scarcity of skilled workers has necessitated an apprenticeship system carried on by the plant itself. In cooperation with the Metal Manufacturers' Association,⁶² Plant B had at the time of the study 14 apprentices, 9 of whom were in the shop. Shop training is given by each department in turn.

Plant C

The product of Plant C is primarily paper-box machinery, four sizes of wrapping machines and stenciling machines. Two sizes of semi-automatic package-covering machines, an automatic package-covering machine, fillers and printing presses are supplementary. The paper-box machinery, fillers and printing presses are manufactured as standard goods, the package-covering machinery on order. The company does its own designing and experiments continually with new designs. Eighty per cent of the product is of the primary type, twenty per cent supplementary. About 10 per cent of standard goods is manufactured for inventory. This and experimental work are

used to stabilize employment. The average value of the product during 1927 was in round numbers \$125,000 per month, \$1,500,000 during the year.

The market extends over New England, the Atlantic coast and the Middle West. A few orders come from the Pacific coast, England, Australia and Spanish America. The demand is seasonal, reaching its peak in September and October in preparation for the Christmas rush, and its duldest season in June and July.

The inner organization of Plant C is complete on the ground, including its finance, purchase and sales departments. The shop departments consist of milling, engine- and turret-lathe, automatic-screw, cam-cutting and grinding-machine, of drill-press, small assembly, parts-inspection, grinding and polishing, machine-assembly, radial-drill, Ingersol-milling, final-inspection, and castings-painting and grinding.

No great changes in the construction of the machines used at Plant C have been made in recent years or are anticipated in the immediate future. Comparatively little of the work is automatic. Certain automatic machines turn out small standard parts. Automatic stops usable on milling machines and turret lathes, the quick traverse of the turret lathe, automatic-speed and feed controls usable on certain jobs on the milling machines save both the physical and mental energy of the workman. The skill of the all-around machinist is regarded by foremen, however, as essential to the type of machine-shop work turned out. Not output, but good workmanship is stressed. The standard of judgment is one of quality; and the men tend to be proud of quality work.

An apprenticeship system is, and has been for many years, conducted independently by the plant. It included at the time of this study 13 boys in the drill-press, milling-machine, lathe, speed-lathe and pattern departments. Less than eight per cent of the present employees have been so trained however. Few of the trained apprentices have remained in shop work. No other regular training is given shop employees, but promotion occurs occasionally as opportunity offers. The personal knowledge

⁶¹ Two assembly workers from the laboratory were included, but they were not used for comparative purposes.

⁶² The employment manager of Plant B had a considerable share in starting the Metal Manufacturers' Association apprenticeship plan. It has been in operation here since September, 1926.

of superintendent, foremen and workmen suffices in so small a shop to arrange all transfers.

Plant D

The product of Plant D consists primarily of all types of power-generating machinery, large and small turbines, condensers, Diesel engines, pumps and jet condensers. Gas engines and auxiliary equipment supplement these. Turbines up to 12,500 kilowatts are manufactured for stock, all above that on order, but the demand for large turbines is expected to increase. Parts for all standard equipment are manufactured for stock, the completed job put together on order. Practically all designs are made by the company engineers, and with constant changes and improvements. The normal value of the yearly output is around 18 million dollars—one and a half millions a month—although the year 1927 averaged only eight hundred thousand a month. The monthly capacity of the plant is reckoned at two million dollars.

The market extends over a large part of the United States, Cuba and Japan. Most of the large power companies of the country use some of Plant D equipment. But the organization of which Plant D is a part has manufacturies in Great Britain which serve the foreign market, and a branch in Cuba as well as other plants in the United States, a total of 15 subsidiary companies. Demand is fluctuating though not seasonal, dependent often upon rush orders.

A complete tabulation of the organization of the factory is not essential for this study. Its shop departments are: pattern-making, foundry, hardening, annealing, blade-shop, heavy-machine-shop, light-machine-shop, assembly and erection, tool-manufacture and supply, testing and inspection. The selections for this study, with the exception of two from the blade shop, come from the light-machine shop which contains engine and turret lathes, drill presses, milling machines and horizontal boring mills.

The type of work and of machines used is rather similar to those of Plant C except that all work tends to be larger, even in the light-machine shop, and orders tend to

include a smaller number of pieces. The size of work often makes a considerable difference in the size of the machines. Accuracy and good workmanship are the qualities especially required of the workman. The newer types of machines tend to increase the accuracy possible by an increased variation in speed and feed controls. Certain of the newer machines have automatic features designed to save the workman's energy. Automatic features, however, are not a prominent part of the machinery, nor is it likely that they will increase. A workman must often work upon six or eight different materials in one day, and often does not have the same job to do twice in one week. Changes in design are constant. Adaptability and a good machinist's knowledge, as well as the ability to work closely, are therefore in Plant D an essential part of the workman's craft.

The apprenticeship system here is comparable to that in use in other allied shops of the company and has been carried on for ten years. Apprentices are trained in special departments under special instruction and with up-to-date equipment. No other training is offered and no systematic promotion occurs. Careful records and consideration by management and foremen, however, give considerable scope to capable, ambitious youths.

In the four plants here described there are many likenesses and many unlikenesses. Plant D is several times as large as any of the other three, larger indeed than the three others combined, in capitalization, in plant facilities, in number of employees and in value of output. Its organization is more complex, its production planning more intricate, its personnel policies more impersonal. From the point of view of work to be done, however, the outstanding difference between the plants rests in their type of product, its size, its standardization, and the extent of its market. Plant A is a production plant turning out a

simple product in large quantities and in comparatively little variety. Its work is highly subdivided and repetitive. Plant B is a specialty shop, its product highly intricate, but limited in variety. The work of its machine shops, though requiring accuracy, tends to be specific; the intricacy resides in the assembly of parts rather than in their manufacture.⁶³ Plants C and D, especially D, make a wider variety of product than either A or B, and with a more limited market for each. Their work tends to be less specialized, more varied, requiring a considerable emphasis on the all-around machinist.

With respect to facilities and services to employees, although there are many individual differences, the plants apparently could be rated as about equal. Policies towards employees and their work are, considering the differences in size of plant and numbers of employees, surprisingly similar. Two of the firms are mildly paternalistic in tendency, while two purposefully avoid any such tendency. But all offer comparable opportunities and attentions to the physical and social well-being of their employees. True, only one firm offers a definite scheme of old-age pensions for long service, but that one, after placing its plant in a new district where ordinary living facilities are scarce, neglects to provide adequately for their employees' everyday physical needs either with proper housing or with a satisfactory cafeteria for mid-

day meals. And while, strictly speaking, these two things have no relation and may not counterbalance one another, yet actually in the minds of many workmen they do have weight; the one offsets the loyalty and appreciation aroused by the other. On the whole, these are firms where industrial relations tend to be harmonious and where the idea of mutual service induces both management and men to have a friendly attitude towards one another and towards the public.

The primary differences in the plants, from the point of view of this study, rests, then, in their different degrees of standardization of product, mechanization of process and specialization of work, and on this basis they were selected. An exact measure of the degree of specialization was not found nor is it important. Judging from observation of the variety of product and the size of orders executed, the four plants stood approximately in the relation one to another which the letters assigned to them—A, B, C and D—indicate.

SKILL RATING AND SPECIALIZATION

With this classification of plants in mind, comparison of the workers' skill, indicated both by rating and by index, is striking. The mean skill rating is found to increase consistently from Plant A to Plant D, while for all but Plant B the average deviations from the mean remain about the same.⁶⁴ The mean skill-indexes increase likewise. Both rating and index increase with variation required in the work. Nor is this true only of the means for

⁶³ This study, it is to be remembered, does not touch the experimental and special-instrument work at Plant B, where one man builds an instrument entire, each man an expert in every phase of its manufacture.

⁶⁴ Omission of apprentices would have brought Plant B into line.

the entire plant. Between the skill indexes of men operating similar types of machines in the different plants a similar tendency is noticeable. All of the material presented in this study on the evaluation of skill indicates that specialization of work may certainly be associated with lesser skill in the workman.⁶⁵

Though other ratings vary, none varies so exactly according to the specialization of work done as does the skill rating. That upon adjustment to the unusual is significantly the nearest to skill. Here the mean rate increases from Plant A to Plant C, though it drops in Plant D below that in Plant B.⁶⁶ But adjustment to the unusual may be regarded as closely allied to one of the main characteristics of skill, its capacity for adaption of response to attain a desired end. The power to adjust or to adapt to varied circumstances or conditions might reasonably be expected to obtain where the need of adaption is inherent in the work done. Moreover the man engaged in repetitive work day after day may very possibly be one who either prefers habitual performance to a varied one or for whom the nature of the work itself has reduced the capacity for change.

The other ratings were discussed previously in relation to skill. Their relation to the degree of specialization in work needs brief comment. The mean rating on habits of work does not

vary with specialization—at least the mean of Plant A is equal to that of Plant D. The mean rating on attitude, as the previous section of the article indicated, is lower for Plant A than for the other three, but is nearly alike for Plants B, C and D. The mean rating on relation of men to management increases from Plant A to Plant C, but drops for Plant D. Of all the ratings, only that of skill consistently varies with specialization, although significant variations do appear. Other factors besides specialization influence the ratings of all the characteristics except skill.

AGE, EDUCATION AND SPECIALIZATION

The figures on the education, trade training and trade experience of the men are also striking. The average grade of school attained before work increased from Plant A to plant C with a slight drop in Plant D which, nevertheless, remained considerably higher than Plant A. Trade training tended to be less for Plants A and B and greater for Plants C and D. And trade experience progressed from A to D regularly with the exception of Plant B, where the youth of the selected men obviously influenced the result. With the exception of Plant B the average age of the selected men increased from Plant A to Plant D. The less educated, less trained, less experienced and younger men, in short, tend to the specialized work which is characteristic of Plant A. It is the better educated, better trained, more experienced and older men, on the whole, who do the more skilled and the less specialized work which is characteristic of Plants C and D.

⁶⁵ See Table I, in June issue of the *PERSONNEL JOURNAL*. See also Table VII in Appendix D.

⁶⁶ The frequent requirement of overtime and night work influenced adversely the attitude of workmen at Plant D.

WAGE AND SPECIALIZATION

The wage of the workman, does not apparently vary exactly with specialization of the work required. The average wage in Plant A is approximately the same as that in Plant C, and while the wage in Plant D averages considerably higher than in Plant A, any difference in degree of specialization of work and skill of the workman between Plant C and Plant D is not great enough to explain such difference in wage. In this connection, it should be remembered that whereas the men of Plant A were fairly contented with their wages, as were the men of Plant D, those of Plant C were less contented with theirs. Quite possibly a larger number of cases covering more factories would show a definite relation between specialization and wage as between factories. The lower rate of wages of both Plants B and C may not be typical of the market as a whole. Obviously it shows that the work is not alone the determinant of wages, that conditions of work or type of management may enter the reckoning and become in part a substitute for wage. But that conjecture is scarcely a new one, and more than conjecture the facts here ascertained do not warrant.

SATISFACTION AND SPECIALIZATION

Finally the discussion of the last section showed that satisfaction in work belonged predominantly to workmen using a fairly high degree of skill, and to the less skilled men only when their capacities and experience had not made them conscious of superiority to their work. If these findings are

typical, obviously the relation of satisfaction and specialization which reduces the degree of skill required needs little further discussion. The workman's satisfaction, if it could be measured, would not necessarily decrease with the increase of specialization; differences in capacity would probably vitiate any such exact relations. But the need to suit capacity to work, or vice versa, stands out in high relief.

THE ELEMENTS OF SKILL UNDER SPECIALIZATION

One other comparison should be made between the specialization of the work and the skill of the workman. And that is the comparison of the different elements making up the skill which the workmen in the different plants exhibit.

The skill analysis named certain skill-factors of which the workman's skill consisted; the average number of these, occurring per therblig in an operation, composed the therblig-skill-average. These skill-factors consisted of adaptation to machine, materials, tools, accuracy of movement, motion saving, adaptation of energy to need and the rest.⁶⁷ A comparison of the average number of each of these skill factors per therblig, as shown in the total operations on each machine in each plant, in other words, the detail of the factors making up the therblig-skill-average of all workmen of each machine is illuminating. Table XIII gives the figures.

Within the shop, as the table shows, the differences from machine to machine were largely in the extent to

⁶⁷ See Part I of this article in June issue of the PERSONNEL JOURNAL.

which each skill-factor was used. Approximately the same skill-factors were utilized by all workmen. Moreover, the variation seems to be well distributed. The higher therblig-skill-average tends in comparison with others of the same shop, to be composed of a larger number of skill units throughout. For example, with a certain few exceptions, the most obvious of which is assembly in Plant B, the work requiring in its performer a greater amount of adaptation to machine, required also a greater amount of adaptation to materials and tools. Self-confidence alone did not at all follow the rule.

Between shops the comparison is quite otherwise. The variation which occurs is not only that of amount but tends also to be that of kind. And the greater number of types are used in the less specialized shops. Adaptation to materials, for example, belonged much more prominently to the workmen at Plants B, C and D than to workmen at Plant A; adaptation to tools belonged especially to Plants C and D as did also plan, aside from its use by assembly men in Plant B; accuracy of movement was outstanding with workmen at Plant B.⁶⁸

⁶⁸ Some variation is due to charting by different investigators. Some also may be due to the difficulty of distinguishing the types of skill-factors; it is sometimes easier to detect skill than the kind of skill. There is a tendency, therefore, in some of the charts to confuse motion saving with adaptation of energy to need, and sensitivity of touch with kinaesthetic sensitivity. Obviously the definitions and limits of each should be more objectively developed. Undoubtedly also skill charting itself requires a skill of its own. These questions, however,

The conclusion from all of the evidence is that a definite and determinable reduction of the skill required occurs in accordance with the degree of specialization of work. In still more highly specialized work than any represented in this study, a greater elimination should certainly be expected, and in some cases, perhaps its practical disappearance. The dexterity which at most would be required could hardly be dignified by the name of skill.

CLASSIFICATION OF PLANTS AND PEAR'S CLASSIFICATION OF SKILL

Still another basis for studying these plants is suggested by Pear's classification of skill given in the opening discussion of this report.⁶⁹ Three of its five grades, he claims, include most of industrial skill today: (a) skill manifested solely in an habitual response, (b) skill exhibiting an habitual response plus a certain minimum of adaptation, and (c) skill utilizing habit but with adaptations expressing the individuality and style of the performer. Much of the selected work of Plant A, must be classified as requiring the first of these three grades of

do not at all destroy the evidence which the table presents.

There is also, without doubt, a difference in skill-factors as used on different machines and in different plants which is not apparent in the figures given. This may be a difference in amount or in type. If it could be determined, it would probably increase the variations shown, but there is no reason to suppose that it would alter at all the nature of the comparisons either within or between the plants.

⁶⁹ See June issue of the *PERSONNEL JOURNAL*.

skill. It was largely habitual performance, even though the habits did require some weeks of training for their perfection—possibly more if the workman had had no previous machine-shop experience. The selected work of Plants C and D, on the other hand, was mostly of the kind requiring the last of these grades of skill. It required a constant habit adaptation and one which ordinarily was highly individual with the performer.

The selected work of Plant B included skill requirements from all three of the grades so that Plant B may not be properly counted an example of a plant using primarily the second grade. Undoubtedly such plants exist. Plant B, as it happens, represented a particularized trade of instrument-making, not so comparable, perhaps, to the other three plants as the latter to each other. It contained within itself nearly the whole range of specialized and unspecialized work. Certain of the selected work at Plant B, however, came nearer to requiring the second of these grades of skill than any in Plants C or D or than most in Plant A, where newer types of machines were in use.

The conclusion seems justified, that on whatever basis the skill of the workmen in the four plants is compared, it will be found to graduate from one plant to another in a regular and determinable fashion. A study of the skill ratings, of the skill-indexes, of the skill-factors, forming the blig-skill-averages, and of the grades of skill as classified by Pear, indicates a definite variation from plant to plant which can be analyzed and classified.

INTER-FACTORY PROMOTION

The revelations of this study fortify the plan already urged that promotion between manufacturing plants within an industry be developed, both for the good of the industry and the good of the workmen.⁷⁰ The gradation of the skill-index and the variation in use of the different skill-factors is most telling evidence that for the use of the workmen's resources such promotion might be valuable and practicable. And at the same time it supplies the necessary method and technique by which such a system of promotion could be developed. The system should be valuable enough, both to the industry and to the workmen, to make experimentation thoroughly worth the time, trouble and risk, if any, involved. A discussion of the need and practicability of the scheme may be useful.

The suggestion of an inter-factory promotion system and the basis indicated for its development does not intend to be an *ipso facto* indictment of repetitive work as such. The returns of this study have not proved that such an indictment is justified. Repetitive work, at present, seems to be satisfactory to and probably desirable for some workmen who might never reach a similar degree of success in work requiring greater skill capacity or development. Industry is to be congratulated on utilizing such men so effectively. Undoubtedly there is a gradation in men's powers of development as there is a gradation in men's

⁷⁰ See especially Anne Bezanson, Promotion from Without, *Quarterly Journal of Economics*, 1921-22, Vol. 36. p.154.

native capacities. The various intelligence and motor tests have shown the latter certainly. Whether or not one looks upon the industrial use of repetitive work as designed to aggravate and intensify those native differences, the great immediate waste in human resource and productive efficiency comes, in keeping at repetitive work, men who have capacities superior to it. Inter-plant promotion might do much to eliminate such waste.

Actually at the present time such a movement of workmen does take place to some extent. This study shows it. Miss Bezanson⁷¹ has especially well pointed out the function of the changes which the workmen themselves make through the movements of labor turnover. Men without an apprentice training, and even men with it, get both training and experience by moving from plant to plant. Practically all of the seventy-five men in this study had experimented with such changes and looked upon them as an essential part of their industrial life. Many of those who at the time of the study were discontented with their work spoke of the desirability of changing it, but hesitated to attempt it, often because of the risk entailed for families and dependents.

The suggestion of an inter-factory promotion system, if carried out, probably would involve little additional movement of labor. It would, rather, regulate the haphazard character of the present method of movement and eliminate many of its evils in risk and waste for both workmen and industry. For there can be no question but that

the present turnover methods are wasteful, both of the energies and earnings of the workmen and of the production planning and wage cost of the management. Organized promotion by this method, based on scientific knowledge of the workmen's skill, might remove a large share of such waste.

The question arises as to whether such promotion would be advantageous to all grades of an industry. Certain factories would tend to serve as training fields for others requiring a higher grade of skill. Might that tendency increase the labor problem for those requiring the lower grades? Undoubtedly it would do so if those factories possess a stable and efficient labor force at present. But the tendency now seems to be for the workmen in such plants to change frequently under present conditions. Those who remain with satisfaction under the present method would in all probability remain under the new one. Those who remain without satisfaction, solely under the drive of economic necessity, may in some cases be as efficient as the standard requires, but are often a source of difficulty and unrest. The opportunity for promotion might of itself prove psychologically beneficial. Moreover, the workmen in Plant A of this study already tended to be younger, less experienced and less trained, as well as less skilled, than those of Plants C and D. No alteration in that relation would take place. The alteration which would occur for Plant A, and possibly even more so for plants requiring less skill than Plant A, would be largely an improvement in morale, a morale built upon

⁷¹ Anne Bezanson. Previous citation.

satisfaction in work as well as upon wage and plant loyalty. And the saving due to a planned-for rather than to a completely haphazard system of labor turnover would be as great for the plants requiring the lower skill grades as for the others.

It is not suggested that the scheme would be a simple one to develop effectively. It would require careful job analysis and skill analysis to make possible any adequate grading of plants. It would require tact and consideration to make the scheme efficient once it was established. Job incentive has shown itself primary for the selected workman of this study, but wage incentive and the incentives arising from conditions of work, both physical and social, were not by any means negligible. Failure to consider either of these might readily counteract the advantage gained from the first. But difficulties are not unsurmountable. The evil of the waste the plan aims to eliminate is sufficient to recommend its consideration.

DESPECIALIZATION AND MECHANIZATION AS ALTERNATIVES

Another alternative is being tried in certain places today, discussion of which is coming slowly to the fore. That is the movement toward despecialization of production and of work. The movement toward specialization and mass production has in certain instances overstepped the bounds of industrial efficiency, and either the exigencies of the market or the wastes of a too fine and overlapping division of labor have turned the course back toward a lesser and more carefully studied type of specialization.

The struggle has been keen between the advantages of mass production and the requirements of intensive marketing cultivating an ever-increasing demand for standard goods. Under the failure of that demand, mass production has over-reached its limits. The result has been a necessary withdrawal, a compromise between the competing forces, namely, "merchandised production," that is, production based on a carefully studied and estimated market and varied in accordance with its changing tastes.⁷² How much that variation will affect the specialization of work and the skill of the workman, it is difficult to say.

At the same time there are instances, some of them on a large scale, where work has been thought too specialized for a proper utilization of the capacities of the workmen, and a policy of deliberate despecialization has been substituted. In at least one large center of a great telephone manufacturing company, the work of installing, testing and repairing, which a few years ago was divided among three men, has now been transferred to one man who is trained in turn in all three tasks. This has been done first, to make him a more efficient producer on any one of them, and second, to make possible his employment in the three kinds of work when the need arises. The initial experiment has proved successful and its further application is being undertaken in other centers.

Despecialization, however, has oc-

⁷² See for example, Paul M. Mazur, *American Prosperity, Its Causes and Consequences*. New York: Viking Press, 1928. p. 130.

curred so far only where special circumstances or an extreme development of specialization had made it necessary. For the present a large degree of specialization, certainly as much as this study has investigated, seems to be sound in basis and established in fact. To increase the efficiency of this existing and working organization of industry and to offset its disadvantages, the engineer needs every facility and assistance.

Quite as likely as the despecialization of industry is the complete mechanization of industry which may some day abolish the repetitive task of the machine tender, and, on a new scale, may capitalize the highly skilled workman. The expectation of such development has occurred to more than one student and observer of industrial history and progress. The time may very possibly come, when the power-driven and electrically-controlled machine will do all the heavy and monotonous work of mankind. The control

of the machine and its maintenance only will depend upon human labor, a labor which will necessarily require thorough training and a comparatively high degree of knowledge for its performance. The nature of skill under such conditions might become completely altered and, for production purposes at least, the technique of the engineer supersede the manual dexterity and kinaesthetic knowledge of the machinist.⁷³

That time, if it is ever to arrive, is still far in the distance. The first and immediate concern of the sociologist, psychologist and industrial engineer is the use of existing resources under existing conditions. A wise and far-sighted application to that task will assist, not impede, future development.

⁷³ Compare John R. Commons, *Industrial Goodwill*, New York: McGraw, 1919 and Stuart Chase. *Men and Machines*. *The New Republic*, March 1929, vol. 58, pp. 61-65.

4. THE NATURE OF SKILL AND ITS NOTATION: A CONCLUSION

The material presented has shown the wide range of skill needed by workmen within a single trade doing comparable kinds of work. It has demonstrated the possibility of evaluating that skill, and has provided a method for doing so. The results lead one to ask what the discussion has contributed toward a knowledge of the character of skill itself.

THE DEFINITION IN THEORY AND PRACTICE

The definition of skill, used as the basis for study, was the *integration of well-adjusted performances*. Habitual

action and the adaption of habitual action to effect a specific result were regarded as its essential and primary characteristics. Unquestionably the analysis and its results have corroborated the definition. In all of the skill studied, its essence has seemed to consist of the integration of adjusted performance. And the discovery of the various grades of skill has emphasized, first, the habitual characteristics and second, the adjustment characteristics involved in skill development, with the latter increasing proportionately with the increase of skill attained.

Indeed the essence of the higher

grades of skill and their chief differentiation from the lower grades has seemed to lie in the degree of adjustment ability which the workmen reached. For example, in the comparatively simple operations of Plant A, where the work was almost entirely repetitive, the workman learned to handle his machine readily and habitually. He learned how to set it, to turn, bore, or grind a specific material—perhaps three materials—into a specific form with, at most, variations in size which it required certain adjustments of his machine to accomplish, adjustments which he became accustomed to handle. He learned a definite order of procedure in his operation and the time required for its performance, through which he proceeded with complete self-confidence. He knew his machine, he knew his operation, knew them intellectually perhaps, knew them kinaesthetically certainly. Each muscular contraction called for its following contraction with perfect precision.

In the learning process he had developed certain habits of response to certain stimuli. The development had called for certain adjustments in muscular activity and response and it had required an integration of those adjustments. The process went on for some time after he was considered trained, probably, and for some months, perhaps, he improved the precision, perfection and speed of his performance. But, according to most of the workmen studied in Plant A, there came a time after which there was no more improvement in performance. From that time on the actions were habitual and for the most part set.

The description does not apply to all of the workmen studied in Plant A. In all of the plants there was variation. But for most of the workmen in Plant A, the variation of response required after the learning period was passed was extremely limited, at least in the operation of the machines.⁷⁴

In the more complex and varied work of Plants C and D the requirements were quite different. Adaptation to his machine and self-confidence in his procedure were no less important with the workman in Plants C and D than with the one in Plant A, but were rather more so; he learned to handle his machine with quite as much assurance. But he learned as well to adapt it to various materials and to use upon it a variety of tools calculated to perform a variety of operations. He learned to plan a varied and intricate procedure and to integrate the whole to produce a no less accurately and precisely worked product. His increased ability to adapt his performance to a varied requirement proved to be the essence of his greater skill attainment.

"ACCIDENT" AND "PROPRIA" ELEMENTS IN SKILL

But there may be question as to the analysis of skill developed and the characteristics of workmanship which were included among the skill-factors. Pear⁷⁵ has divided skill into what he terms its "accident" and "propria"

⁷⁴ In their set-up, the needed variation was somewhat greater, as the therblig-skill-average indicated.

⁷⁵ T. H. Pear. *The Nature of Skill*. *Journal of National Institute of Industrial Psychology*, Oct. 1928, vol. 4, pp. 193-202.

elements. Under the former he lists the sensitivities, that is, the discriminatory powers, and the knowledge used. These seemed to him basic to skill development, but not a part of its essence. The essence, i.e., the *propria* element, he places in the muscular coördinations. This study has grouped these elements together. Their separation has seemed to the writer logical but not practical. From the point of view of skill there is no separation other than a logical one between the trained muscle and its functioning, or between a trained power of discrimination and its response to its given stimulus. The possession of the native structure may indeed be an accident factor in skill development; but the possession of a trained and developed structure is a part of its essence. And it includes the whole of the organism which is an integral part of the functioning. The knowledges and developed sensitivities, therefore, are as essential a part of a skill performance as the muscular activities themselves. The vital element is that they shall all have a muscular expression which is itself the integration of all the functioning which the organism employs to produce a desired result.

Pear's distinction between accident and *propria* elements in skill and his apparent tendency to exclude from the latter all but the muscular coördination which immediately precedes the result may be based in part upon the distinction made in various investigations between sensory discrimination and a skilled performance which is apparently allied. An example is the low correlation found by Seashore⁷⁶

between sensitivity of ear to pitch, at a physiological limit, and musical skill. Obviously the correlation between any general sense perception and a skill which plainly utilizes that sense organ might be extremely low unless the discriminatory power tested were actually one used in the skill performance. And for much musical performance a rather wide variation in accuracy of pitch is plainly permissible. According to Seashore, however, the cognitive element in sensory discrimination does, with training, improve the use of a given power. In any developed skill also a discriminatory power which is used is one trained to a particular function, whatever the native capacities of the organ concerned. In this study, consequently, sensitivity of eye and ear are, more exactly, the adaptation of eye or ear to discriminate in relation to a particular performance. Upon that basis the writer claims that the developed sensitivities, as well as the intellectual and kinaesthetic knowledge which direct the muscular coördination of which the performance consists, are an essential part of the performer's skill.

Nor are they the less essential because they are not always the same for all performers. Some of the operations selected for this study required a particular ability to be developed, an ear trained, for example, to detect a particular hum which indicated a particular condition or relation in the performance, necessary because it was the only method of detection possible. But most operations allowed a variety

⁷⁶ Carl E. Seashore, *The Psychology of Musical Talent*, Boston: Silver, Burdett

& Co., 1919, Chapter II. This is quoted by T. H. Pear, in *Skill*. JOURNAL OF PERSONNEL RESEARCH, April 1927, vol. 5, no. 12, p. 486.

of abilities. What one workman detected by a specific hum, another detected by a specific vibration in his wrist or forearm, and still another by both methods in conjunction. The study demonstrated that the last tended to be the most skillful workman, but it was not invariably so. The variety of methods used and permissible did not make the act of detection any the less an essential part of the performance.

KINAESTHETIC AND SENSE KNOWLEDGE IN SKILL

One conclusion seems inevitable, however one looks upon the above discussion. By the nature of skill, it is apparently a kinaesthetic and sense knowledge which forms the basis of the power of adjustment and adaptation.

Just how that kinaesthetic and sense knowledge is attained is less certain. It is usually assumed that it can only be by kinaesthetic and sense practice, if one may use such terms.⁷⁷ Yet recent apprenticeship methods in the metal trades are tending to increase the amount of schoolroom work, i.e., shop mathematics, mechanical drawing and principles of mechanics, given to the apprentice, not so much to increase his knowledge of his trade over that of his predecessors, as to supplement his shop experience. The expectation is that he will translate the knowledge acquired in the schoolroom into his practical work at the bench or machine. Knowledge of materials, for example, at least of the three basic ones, must be for any skilled machinist

a kinaesthetic knowledge of the speeds and feeds which he may use to work the materials, whatever his theoretical knowledge of their strength and resistance. Even if the practical work of the present-day apprentice is more limited in scope than that of his predecessor of a generation ago, the theory of the system assumes a translatable element from the theoretical to the practical field. The assumption has not yet been proved conclusively. Much more experimental work needs to be done on the subject to satisfy the scientific observer. But there may well be intellectual shortcuts to kinaesthetic skill attainment.

ACCURACY IN INDUSTRIAL SKILL TO-DAY

At least one quality in industrial skill attainment, namely accuracy, was not analysed closely enough in the course of this study. In all of the plants, accuracy of movement ranked high among the skill-factors charted. Especially in Plant B, it played a striking part. But knowledge of the plants leads the writer to believe that accuracy not only should predominate still more in the skill of the workmen of Plant B, but that in the skill shown at Plant A also it should appear as more significant. Probably in all the plants, accuracy was a larger element in the skill required than the charting indicated.

The fault lies in the lack of a technique, as yet, for measuring the degree of any one skill-factor entering into skill. The point demonstrates a very subtle distinction, inherent in the nature of skill, between the amount of skill and the extent of it involved in

⁷⁷ Compare W. F. Book, *The Psychology of Skill*, New York: Gregg, 1925.

any performance. It is possible to analyse any activity and to point out the parts of it and the movements when skill is in play; but it is not yet possible to say how much skill is in play at any given moment. So, though one may count the exhibitions of skill in a performance and get an evaluation of it in comparison with other performances of its kind, one may not yet get an actual measure. A new and more carefully considered analysis of skill is needed.

MOVEMENT AND TIME IN SKILL NOTATION

The method attempted in this study has been the detection of skill and its evaluation in terms of movements. The evaluation might well have been done in terms of time. Once the skill was detected, the average skill used by a workman in a specific time interval might have served as the unit of measure. The index would then have been quite as easily computed. This was not done for several reasons. In the first place, the attitude of the workman toward the stop watch seemed to preclude the use by the investigator of any such means of time notation, and the expense of micro-motion films made it prohibitive on a large scale. Secondly, the essence of the workman's skill seemed more vitally associated with his movement than with the time involved in it. Merely to note time involved might seem also to neglect the qualities necessary to good work. The use of the therblig as a unit of uniform length regardless of time was a daring venture, but one which the results have fairly well shown to be justified and sound.

Experiments were made with simo-skill-charts on a time basis, however, in all of the selected plants. At least two moving pictures were taken of certain of the selected operations in each plant according to the Gilbreth method whereby time was measured in terms of "winks" or one two-thousandth of a minute. The films were analysed under slow-motion scrutiny, and simo-skill-charts made which yielded a wink-skill-average comparable to the therblig-skill-average for each workman filmed.

The pictures were taken for experimental purposes only but they yielded two important results. They demonstrated the accuracy of the movement observation and the process charting already done, and they produced a limited opportunity for comparison between the two methods of skill evaluation. The first point speaks for itself; the second needs further illumination.

On most of the operations selected it was found that the two averages were surprisingly alike and that the variations between them were comparable.⁷⁸ Upon certain operations where one part of the performance continued for an extended time—either a long period of a specific work movement or a long period of waiting, in either of which the therblig of uniform length would have counted as a unit in terms of movement regardless of the time consumed in its performance—upon such

⁷⁸ Films were made of operators upon an I. D. grinder and an engine lathe at Plant A, upon two engraving machines at Plant B, upon a milling machine and a turret lathe at Plant C, and upon a drill press and a turret lathe at Plant D.

operations, the therblig-skill-average and the wink-skill-average differed in accordance with the proportion of the whole time of the operation occupied by the extended portion. The engraving operations and the selected milling operation proved to be of this type, though the set-up of the engraving machine pictured was not of this type.

Enough films of a kind were not made to test out the skill index variation if calculated on a time unit. But the indications were that, upon the same work at least, it would be comparable to that found by using the therblig unit. Further research would be necessary to produce decisive results.

On the whole the writer inclines toward the view that for the high skills at least, such as those observed in this study, movement is the most vital element in skill notation, whether or not the time occupied in the movement is included.⁷⁹

THE THERBLIG IN SKILL NOTATION

The prime criticism which rises concerning the method used in this study centers chiefly around the Therblig. The basis of movement notation used has been the therblig; and the therblig, while excellent for the job analysis for which it was developed, in its present form is not specific enough for skill analysis. A much more detailed and keenly divided movement notation is needed to discover a unit of move-

ment accurately fitted to the study of skill and conducive to its true measurement, a notation which shall be both detailed and flexible.⁸⁰ The essence of any motor skill must certainly be in the relation of the functioning of the various muscles and sense organs involved in its performance. To discover and to analyse any such relation will require a perfected technique of movement notation, and much further research. More accurate analysis of skill might probably follow. The understanding of skill is indeed in its infancy.

But the study of certain workmen in the four plants here described has revealed a fruitful and original attack. However crude the investigation may seem, however inexact its method, and however limited its number of cases, it has developed a means of skill evaluation which both opens the door to new ventures and in itself produces surprisingly telling results. A method which detects, as this one does, not only differences in skill used by different workmen but differences in the skill of the same workman, on different occasions, both in accordance with the specific work done and in accordance, apparently, with some factor within the workman such as his mood and condition, has gone far enough to be immediately useful. When it has obtained an evaluation of industrial skill which will stand even the tests levelled at it in this study, it has attained much practical value. Indeed, in spite of its faults, and no one appre-

⁷⁹ Probably both are integral in different spheres of activity. Experimentation may later analyse and compare them. Compare Frank B. Gilbreth, *The Laws of Motion Economy*, on the relation of the therblig to skill.

⁸⁰ Compare F. M. Earle, *Occupational Analysis*, National Institute of Industrial Psychology, Report No. 1, for a method which is detailed but not flexible.

ciates more keenly than the persons associated with the study its limitations at every stage of its development, it has succeeded in suggesting a number of relationships which, if not proved, are at least extremely interesting as evidence. And it has opened the door for further research. One study is being made at the present time. Annie Shaw, who served as one of the investigators in this research and who helped to develop its technique, has continued the attempt to detect and to analyse skill as it is exhibited in certain industrial performances. Her attack was a new one, and it is hoped that it has found a more completely objective method of evaluating skill attainment.

SKILL IN THE FUTURE INDUSTRIAL DEVELOPMENT

The significance of skill in modern industrial development is certainly not a new subject for thought. The vast changes in industrial organization and processes which are being constantly introduced have been frequently discussed. They have been described more than once as comparable to the revolution of a hundred years ago and the introduction of the factory system. A description of what is happening is vital. But no less vital is the significance of the developments and of their effects upon production, upon the life and personality of the producer, and upon social organization.

There is a trite statement that knowledge is power. Akin to it but less exploited is the realization that skill is power. If prophecies about mechanization prove correct and automatic machinery becomes prevalent, the skilled workman may in most cases

be displaced by the technician. It would be easy to question the expectation of that event on the basis of existing facts; the present use of skill is probably greater by far than many persons realize. But assuming the trend of industry to-day to be toward such development, skill may become divorced from technique as, in the last century or so, art has tended to become divorced from technique. The time was when art was an integral part of many of the crafts, and the workman, who had the capacity to become so, might be artist as well as artisan. To-day, for most of humanity in industrial civilization, art has become a spiritual and aesthetic force tending to belong primarily to the realm of leisure. So the time may come when skill will follow a similar road. The arts and sports are still tremendous fields for the development and display of skill, but it is a grave question whether industry can afford to dispense with it as a non-essential, or, for its purposes, an inferior factor. Skill may be a primary source of power and satisfaction in the working life of the individual. Will that power and satisfaction proceed as well from the spread of technique? Or is there, for many people, value in trained kinaesthetic activity which intellectual functioning could not replace? If such value exists, does it belong only to the individual, that is, is it a psychological problem primarily? Or is industry in danger of casting off one source of power without reckoning whether there exists, or will exist, enough of the other to fill its needs?

The questions are unlimited. The essence of all of them shows the need

for study of the nature of this phenomenon so vital to man's development up to the present time—his skill capacities and accomplishments and their significance to himself and to the new evolution of his social and industrial techniques. The answer depends equally upon the industrial engineer, the psychologist and the sociologist, and upon their coöperation.

APPENDIX D*

TABLE IV

*A summary of correlations, including probable errors, between skill-indexes and other factors.
Four plants*

Correlations using unit intervals based on Pearson's formula: $r = \frac{\sum xy}{N\sigma_x\sigma_y} \pm .6745 \frac{(1-r^2)}{\sqrt{N}}$

CHARACTERISTICS OF THE WORKMEN	S.I. ₁		S.I. ₂		S.I. ₃	
	r	P.E.	r	P.E.	r	P.E.
Plant A						
Production standing.....	.17	±.14	.10	±.15	-.11	±.15
Skill rating.....	—	—	—	—	.28	±.14
Habits of work.....	—	—	-.27	±.13	-.26	±.13
Attitude to work.....	—	—	.23	±.13	.24	±.14
Relation to management.....	—	—	.18	±.14	—	—
Education.....	—	—	-.29	±.12	—	—
Trade training.....	—	—	-.02	±.14	—	—
Wage.....	—	—	-.00	—	—	—
Plant B						
Production standing.....	.73	±.08	.79	±.06	.79	±.08
Skill rating.....	—	—	—	—	.91	±.03
Habits of work.....	—	—	.56	±.12	.65	±.12
Attitude to work.....	—	—	.48	±.13	.59	±.13
Relation to management.....	—	—	-.03	±.17	—	—
Education.....	—	—	.18	±.16	—	—
Trade training.....	—	—	-.16	±.13	—	—
Wage.....	—	—	.46	±.14	.73	±.10
Plant C						
Production standing.....	.72	±.10	.77	±.08	.80	±.09
Skill rating.....	—	—	—	—	.65	±.12
Habits of work.....	—	—	.63	±.11	.66	±.12
Attitude to work.....	—	—	.79	±.08	.71	±.10
Relation to management.....	—	—	.17	±.21	—	—
Education.....	—	—	-.22	±.20	—	—
Trade training.....	—	—	.31	±.01	—	—
Wage.....	—	—	.52	±.19	.76	±.11
Plant D						
Production standing.....	.51	±.11	.67	±.08	.66	±.08
Skill rating.....	—	—	—	—	.05	±.15
Habits of work.....	—	—	-.33	±.13	-.29	±.40
Attitude to work.....	—	—	-.13	±.15	-.11	±.15
Relation to management.....	—	—	-.32	±.13	—	—
Education.....	—	—	.56	±.13	—	—
Trade training.....	—	—	-.04	±.13	—	—
Wage.....	—	—	.35	±.15	.37	±.14

* Appendices A to C were given in Part I, in the June number.

TABLE V
Age of workmen

AGE IN YEARS	TOTAL	PLANTS			
		A	B	C	D
Total.....	75	27	15	11	22
Under 25	11	4	7	—	—
25 to 35	33	12	7	6	8
35 to 45	22	9	1	3	9
Over 45	7	1	—	1	5
Not listed	2	1	—	1	—
Mean age.....	33.4	32.7	26	35	38.6
Average deviation.....	7.1	6.4	5.6	6.0	6.3

TABLE VI
Production standing of selected workmen

PRODUCTION GRADE	TOTAL	PLANTS			
		A	B	C	D
Total.....	75	27	15	11	22
A	41	15	7	5	14
B	23	10	4	4	5
C	5	—	2	1	2
Not listed	6	2	2	1	1

TABLE VII
Rating of skill of selected workmen

SKILL RATING	TOTAL	PLANTS			
		A	B	C	D
Total rating					
Total.....	71	24	15	10	22
20 to 30	4	3	1	—	—
30 to 40	12	10	2	—	—
40 to 50	11	9	2	—	—
50 to 60	8	1	4	1	2
60 to 70	5	1	1	2	1
70 to 80	11	—	1	3	7
80 to 90	15	—	4	2	9
90 to 100	5	—	—	2	3
Mean.....	61.3	39.6	59.0	77.0	79.5
Average deviation.....	19.5	7.5	16.8	10.4	8.7

TABLE VII—*Concluded*

SKILL RATING	TOTAL	PLANTS			
		A	B	C	D
Technical rating					
Total.....	71	24	15	10	22
<i>1 to 10</i>	15	12	3	—	—
<i>10 to 20</i>	16	10	6	—	—
<i>20 to 30</i>	22	2	1	5	14
<i>30 to 40</i>	18	—	5	5	8
Mean.....	21.0	10.6	20.3	31.0	28.9
Average deviation....	9.5	5.8	10.4	5.0	4.7
Manual rating					
Total.....	71	24	15	10	22
<i>7 to 12</i>	15	7	5	1	2
<i>12 to 17</i>	31	15	5	2	9
<i>17 to 21</i>	25	2	5	7	11
Mean.....	15.2	13.7	14.5	17.5	16.5
Average deviation....	3.0	2.3	3.3	2.8	2.9
Sensitivity rating					
Total.....	71	24	15	10	22
<i>1 to 3</i>	6	3	3	—	—
<i>3 to 6</i>	29	20	5	3	1
<i>6 to 9</i>	36	1	7	7	21
Mean.....	6.3	4.7	5.8	7.1	7.8
Average deviation....	1.7	.7	2.0	1.3	.3
Personality rating					
Total.....	71	24	15	10	22
<i>1 to 10</i>	13	12	1	—	—
<i>10 to 20</i>	22	11	7	2	2
<i>20 to 30</i>	35	1	7	8	19
<i>Not given</i>	1	—	—	—	1
Mean.....	18.1	10.4	19.0	23.0	24.0
Average deviation....	6.8	5.4	3.6	3.2	1.8

TABLE VIII
*Ratings of selected workmen in four plants**

RATINGS	TOTAL	PLANTS			
		A	B	C	D
Habits of work					
Total rating.....	75	27	15	11	22
25 to 50	—	—	—	—	—
50 to 75	11	3	4	2	2
75 to 100	62	23	11	8	20
Not given	2	1	—	1	—
Mean.....	—	90.6	87	88	91.3
Standard deviation....	—	9.7	12.9	12.15	8.1
Adjustment to unusual in work					
Total rating.....	75	27	15	11	22
25 to 50	23	14	2	3	4
50 to 75	25	5	2	3	15
75 to 100	13	5	2	4	2
Not given	14	3	9	1	1
Mean.....	58.4	53	62.5	65	60
Average deviation....	15.7	18.2	16.6	18.0	18.7
Attitude toward work					
Total ratings.....	75	27	15	11	22
25 to 50	6	6	—	—	—
50 to 75	28	15	3	3	7
75 to 100	38	4	12	7	15
Not given	3	2	—	1	—
Mean.....	—	63.5	80	82.7	84.3
Standard deviation....	—	14.4	11.75	7.4	11.2
Attitude toward management					
Total ratings.....	75	27	15	11	22
25 to 50	7	6	1	—	—
50 to 75	19	5	5	—	9
75 to 100	45	13	9	10	13
Not given	4	3	—	1	—
Mean.....	—	75.5	77	97.8	84.3
Standard deviation....	—	26.6	16.9	5.7	15.4

* Averages based on unit scores, except for adjustment to unusual.

TABLE IX
Grade at which workmen left school

GRADE COMPLETED	TOTAL	PLANTS			
		A	B	C	D
Total.....	75	27	15	11	22
Grade school, total.....	36	20	3	5	8
Fifth.....	1	1	—	—	—
Sixth.....	4	4	—	—	—
Seventh.....	8	4	2	—	2
Eighth.....	23	11	1	5	6
High school, total.....	21	4	5	5	7
Partial.....	16	4	4	2	6
Complete.....	5	—	1	3	1
University.....	1	1	—	—	—
Not listed.....	17	2	7	1	7
Mean grade.....	8.7	7.6	9.25	9.6	8.9
Average deviation.....	1.6	1.3	1.4	1.6	1.3

TABLE X
Trade training of workmen

TRADE TRAINING RECEIVED	TOTAL	PLANTS			
		A	B	C	D
Total.....	75	27	15	11	22
No training.....	34	11	10	3	10
Trade apprentice.....	25	5	3*	6	11
Partial.....	9	2	3*	—	4
Complete.....	16	3	—	6	7
Other system.....	4	2	—	1	1
Other trade apprentice.....	9	8	1	—	—
Not listed.....	3	1	1	1	—

* In process.

TABLE XI
Average weekly wage (selected period, 1927)

WEEKLY WAGE EARNED	TOTAL	PLANTS			
		A	B	C	D
Total.....	75	27	15	11	22
\$15 to \$20	3	—	3	—	—
\$20 to \$25	2	—	2	—	—
\$25 to \$30	7	1	5	1	—
\$30 to \$35	12	8	2	—	2
\$35 to \$40	20	7	2	4	7
\$40 to \$45	16	8	—	1	7
\$45 to \$50	6	1	—	1	4
\$50 to \$55	0	—	—	—	1
\$55 to \$60	2	—	—	—	2
Not listed	—	2	1	4	—
Mean wage*.....	—	\$37.92	\$27.28	\$37.00	\$42.11
Average deviation....	—	3.93	5.20	4.00	\$4.13

* Averages are based on unit scores.

TABLE XII
Satisfactions of selected workmen, in job, wage and conditions of work

GRADE OF SATISFACTION SOURCES*	TOTAL	WORKMEN IN PLANTS							
		A		B		C		D	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Satisfactions of selected workmen on the job									
Total.....	75	27	100	15	100	11	100	22	100
A	35	3	11	5	33	10	91	17	77
B	13	7	26	4	27	—	—	2	9
C	20	14	52	5	33	—	—	1	5
Indifferent	2	1	4	1	7	—	—	—	—
Not listed	5	2	7	—	—	1	9	2	9
Satisfactions in wage of selected workmen									
Total.....	75	27	100	15	100	11	100	22	100
A	23	2	7	8	53	1	9	12	55
B	24	19	73	1	7	2	18	2	9
C	18	4	13	5	33	7	64	2	9
Indifferent	—	—	—	—	—	—	—	—	—
Not listed	10	2	7	1	7	1	9	6	27
Satisfactions in conditions of work for selected workmen									
Total.....	75	27	100	15	100	11	100	22	100
A	26	—	—	12	80	9	82	5	23
B	23	13	48	3	20	1	9	6	27
C	14	9	34	—	—	—	—	5	23
Indifferent	2	2	7	—	—	—	—	—	—
Not listed	10	3	11	—	—	1	9	6	27

* Grade of satisfaction is based on numbers of sources of satisfaction.

TABLE XIII

Therblig skill averages of selected workmen on machines operated

MACHINES OPERATED	ALL THERBLIG SKILL AVERAGES	AVERAGE OF SPECIFIED SKILL UNITS PER THERBLIG											
		Machines	Material	Tools	Accuracy	Motion saving	Adaptation of energy to need	Self-confidence	Plan	Sensitivities of			
										Eye	Ear	Touch	Kinesthetic
Plant A													
Plant average.....	2.19	.42	.09	.06	.38	.04	—	.85	—	.22	—	.13	—
Grinder I.D.....	2.32	.57	.08	.09	.55	.01	—	.74	—	.19	.01	.08	—
Grinder O.D.....	1.81	.28	.13	.02	.27	—	—	.85	—	.15	—	.11	—
Grinder surface.....	1.07	.26	.10	.06	.13	.05	—	.35	—	.06	—	.06	—
Groover.....	2.80	.36	.11	.17	.52	.11	—	1.00	—	.37	—	.16	—
Lathe engine.....	2.33	.45	.15	.08	.40	.02	—	.91	—	.22	—	.10	—
Lathe turret.....	2.58	.53	.05	.04	.44	.02	—	1.00	—	.30	—	.20	—
Punch press.....	1.82	.21	—	—	.21	.07	—	1.00	—	.18	—	.15	—
Plant B													
Plant average*.....	3.27	.08	.21	.10	.81	.09	.76	.77	.26	.10	—	.04	.05
Assembly.....	4.07	—	.27	.03	1.00	.05	1.00	1.00	.53	.09	—	.01	.09
Drill Press.....	2.08	.06	.10	.08	.42	—	.68	.68	—	.02	—	.02	.02
Engraving.....	2.37	.16	.17	.12	.65	.24	.38	.38	—	.15	—	.12	—
Hand screw.....	3.95	.27	.25	.23	1.00	—	1.00	1.00	.05	.10	—	—	.05
Punch press.....	1.75	.25	.10	—	1.00	—	—	.40	—	—	—	—	—
Plant C													
Plant average.....	3.22	.50	.14	.41	.65	.21	.02	.81	.05	.18	.04	.09	.12
Drill press.....	2.23	.18	.11	.68	.28	.02	—	.33	—	.14	—	.35	.14
Lathe engine.....	3.09	.48	.24	.50	.41	.36	—	.52	.13	.23	.01	.06	.15
Lathe turret.....	3.61	.64	.11	.35	.83	.25	—	.98	.04	.19	.05	.05	.12
Milling machine.....	2.91	.33	.07	.30	.75	.02	.09	1.00	.01	.12	.05	.10	.07
Plant D													
Plant average.....	3.41	.49	.31	.49	.37	.08	.14	.95	.14	.25	.13	.06	—
Horizontal bore.....	3.94	.86	.70	.63	.72	—	—	.66	.07	.27	.02	.01	—
Drill press (1).....	2.32	.50	.17	.40	.03	—	—	.99	.02	.09	.08	.04	—
Drill press (2).....	3.69	.52	.36	.51	.11	.45	—	1.00	.10	.33	.15	.16	—
Grinder.....	2.72	.51	.24	.19	.24	.16	—	1.00	.09	.14	.08	.07	—
Lathe engine.....	3.54	.32	.28	.49	.62	.02	.46	.79	.06	.29	.12	.09	—
Lathe turret.....	4.76	.56	.44	.63	.72	.04	.58	.99	.08	.46	.19	.07	—
Milling machine.....	3.44	.52	.39	.61	.17	.09	—	.99	.04	.36	.26	.01	—
Planer.....	2.97	.35	.12	.36	.53	—	—	1.00	.55	.05	—	.03	—

* The average S/T without assembly is 2.50 for Plant B.

TABLE XIV
Marital status and size of family. Selected workmen, Plants A, B, C and D

	TOTAL	PLANTS			
		A	B	C	D
Marital status of workmen					
Total.....	75	27	15	11	22
Single.....	18	3	8	2	5
Married.....	53	23	6	8	16
Widowed.....	1	—	—	—	1
Not given.....	3	1	1	1	—
The size of family of married workmen					
Total with families.....	53	23	6	8	16
No children.....	18	10	2	2	4
One child.....	8	3	—	2	3
Two children.....	13	6	1	1	5
Three children.....	7	1	2	2	2
Four or more children.....	7	3	1	1	2

TABLE XV
*Grade of home. Selected workmen, Plants A, C and D**

PER CENT GRADE OF HOME	TOTAL	PLANTS		
		A	C	D
Total.....	60	27	11	22
100	11	6	3	2
100-85	17	12	4	1
85-70	13	3	2	8
70-55	8	3	—	5
55 and below	2	—	—	2
Not listed	9	3	2	4

* Information was not obtained for Plant B.

TABLE XVI
Leisure-time activities of selected workmen

TYPE OF ACTIVITY	TOTAL	MEN ENGAGING IN GIVEN ACTIVITIES IN GIVEN PLANTS			
		A	B	C	D
Sports, outdoor.....	37	20	4	5	8
Sports, indoor.....	32	15	2	5	10
Amusements A*.....	37	21	2	8	6
Amusements B*.....	20	11	1	6	2
Home.....	54	24	3	10	17
Men reported.....		24	5	10	20

* Amusements A include moving pictures, musical shows, vaudeville, etc. Amusements B include opera, theatre, concerts, lectures, etc.

TABLE XVII
Trade experience of selected workmen. Plants A, B, C and D

YEARS IN EMPLOYMENT	TOTAL	PLANTS			
		A	B	C	D

Trade experience of workmen in present employment

Present employment.....	75	27	15	11	22
Under 5 years.....	30	12	13	3	2
5 to 10 years.....	29	10	1	5	13
10 years and over.....	14	4	1	2	7
Not listed.....	2	1	—	1	—

Trade experience of workmen in previous employment

Other machine shop.....	41	14	8	9	10
Under 5 years.....	17	5	5	5	2
5 years and over.....	24	9	3	4	8
Other trade.....	44	19	11	5	9
Not listed.....	2	1	—	1	—

TABLE XVIII
Comparison of S.I.₁ with production standing. Selected workmen, Plant A

S.I. ₁	GRADE OF PRODUCTION STANDING			
	TOTAL	1	2	3
Total.....	21	—	8	13
50-75	3	—	2	1
75-100	6	—	1	5
100-125	10	—	4	6
125-150	1	—	1	—
150-175	1	—	—	1

TABLE XIX
Comparison of S.I.₃ with skill rating. Selected workmen, Plants A and D

S.I. ₃	SKILL RATING				
	Total	1-25	25-50	50-75	75-100

Plant A

Total.....	21	1	18	2	
1-25	1		1		
25-50	3		2	1	
50-75	9	1	8		
75-100	8		7	1	
100-125					
125-150					
150-175					
175-200					

Plant D

Total.....	21			6	15
1-25					
25-50					
50-75	2			1	1
75-100	7			2	5
100-125	4			1	3
125-150	6			2	4
150-175	1				1
175-200	1				1

TABLE XX

Comparison of S.I.₂ with habits of work. Selected workmen, Plants A and D

S.I. ₁	RATINGS ON HABITS OF WORK				
	Total	60-70	70-80	80-90	90-100
Plant A					
Total.....	21	1	3	5	12
25-50	1				1
50-75	3			1	2
75-100	4	1			3
100-125	10		1	4	5
125-150	3		2		1
150-175					
Plant D					
Total.....	21	1	4	5	11
25-50					
50-75	3				3
75-100	9		1	2	6
100-125	3		1	1	1
125-150	5	1	2	1	1
150-175	1			1	

TABLE XXI

Comparison of S.I.₂ with attitude toward work. Selected workmen, Plants A and D

S.I. ₁	RATINGS OF ATTITUDE TOWARD WORK			
	Total	25-50	50-75	75-100
Plant A				
Total.....	21	4	12	5
25-50	1		1	
50-75	3	1	2	
75-100	4	1	2	1
100-125	10	2	6	2
125-150	3		1	2
150-175				
Plant D				
Total.....	21	0	5	16
25-50				
50-75	3			3
75-100	9		3	6
100-125	3		1	2
125-150	5		1	4
150-175	1			1

TABLE XXII

*Comparison of S.I.₂ with ratings on relation to management. Selected workmen,
Plants A, B, C and D*

S.I. ₂	RATINGS ON RELATION TO MANAGEMENT			
	Total	25-50	50-75	75-100

Plant A				
Total.....	21	5	3	13
1-25				
25-50	1		1	
50-75	3	1	1	1
75-100	4			4
100-125	10	1	1	8
125-150	3	3		
150-175				

Plant B				
Total.....	15	1	6	8
1-25	1			1
25-50	3		2	1
50-75	1		1	
75-100	2			2
100-125	6	1	2	3
125-150	2		1	1
150-175				

Plant C				
Total.....	10	0	0	10
1-25				
25-50	1			1
50-75	4			4
75-100	—			—
100-125	3			3
125-150	2			2
150-175				

Plant D				
Total.....	21	0	8	13
1-25				
25-50				
50-75	3	—	—	3
75-100	9	—	4	5
100-125	3	—	—	3
125-150	5	—	4	1
150-175	1	—	—	1

TABLE XXIII

Comparison of S.I.₃ with grade of school attained. Selected workmen, Plants A, B, C and D

S.I. ₃	TOTAL	GRADE OF SCHOOL ATTAINED			
		5-6	7-8	9-10	11-13

Plant A					
Total.....	21	5	13	2	1
25-50	—				
50-75	3		3		
75-100	5		3	1	1
100-125	10	4	5	1	
125-150	3	1	2		
150-175					

Plant B					
Total.....	8		3	3	2
25-50	3		1	1	1
50-75	—				
75-100	2		1	1	
100-125	3		1	1	1
125-150	—				
150-175					

Plant C					
Total.....	10		5	2	3
25-50	1			1	
50-75	4		1	1	2
75-100	—				
100-125	3		3		
125-150	2		1		1
150-175					

Plant D					
Total.....	13	—	7	6	—
25-50					
50-75	2		2		
75-100	7		4	3	
100-125	—				
125-150	3			3	
150-175	1		1		

TABLE XXIV
Comparison of S.I.₂ with trade training. Selected workmen, Plants A, B, C and D

S.I. ₂	TOTAL	GRADE OF TRADE TRAINING				
		1	2	3	4	5

Plant A						
Total.....	23	10	8	1	1	3
1-25						
25-50	1	1				
50-75	3		2			1
75-100	6	4	2			
100-125	10	4	3	1		2
125-150	3	1	1		1	
150-175						

Plant B						
Total.....	15	11	1		3	—
1-25	1				1	
25-50	3	2	1			
50-75	1	1				
75-100	2	2				
100-125	6	4			2	
125-150	2	2				
150-175						

Plant C						
Total.....	10	3	—		1	6
1-25						
25-50	1	1				
50-75	4	1				3
75-100	—					
100-125	3	1				2
125-150	2				1	1
150-175						

Plant D						
Total.....	18	6	1		5	6
1-25						
25-50						
50-75	3	2			1	
75-100	7	2			2	3
100-125	2				1	1
125-150	5	2			1	2
150-175	1		1			

TABLE XXV
Comparison of S.I.₂ with wage. Selected workmen, Plant A

S.I. ₂	WAGE PER WEEK		
	Total	25-35	35-45
Total.....	23	6	17
25-50	1	1	
50-75	3		3
75-100	6	2	4
100-125	10	3	7
125-150	3		3

Manuscript received October 7, 1929

The Outlook in the Measurement of Interests

BY THE RESEARCH COMMITTEE UPON THE MEASUREMENT OF INTERESTS¹

What is an interest? Precisely what is meant by an occupational preference, a liking, an antipathy? How can the fact of its presence in a person's make-up be certainly ascertained, its strength measured and its persistence determined? Such questions come to the fore in the following array of live research problems which challenge the contemporary investigator of interests.

The editor would like to see this whole array of problems attacked more directly than has heretofore been usual. Why not study the nature, direction and power of a boy's interests, not by ASKING him whether he likes or dislikes aviation, piano practice, robbing birds' nests, and solving originals in geometry, but by determining his actual behavior when face to face with authentic alternative opportunities, under controlled conditions? Such an approach brings the investigator at least one step closer to the living phenomenon of interest. An intelligence test measures intelligence in action. It requires that intelligence be exercised. An interest test should likewise demand, not a verbal statement about an interest, but its actual functioning.

INTERESTS are coming to be regarded as an important psychological factor to be considered in the personnel examination, both in industry and in education. Yet the measurement of interests has but ten years of research behind it, although

over fifty individuals have been engaged in research in the field of interests during this period. While much has been accomplished in establishing measuring devices of interests, the practical application of inventories and tests has gone far beyond our knowledge of their value. Everything points to a wide usefulness of interest measures, possibly a usefulness equal to intelligence measures. But before these measures are given authority in guidance and selection more should be known of their validity, reliability, and standards.

This major problem invites careful

¹ Committee appointed at the Atlantic City meetings of the National Vocational Guidance Association, to encourage practical research projects in the measurement of interests. The committee is composed of the following members: Karl M. Cowdery (Stanford), Douglas Fryer (New York), Harry D. Kitson (Columbia), Donald G. Paterson (Minnesota), E. K. Strong (Stanford), R. S. Uhrbrock (Cornell).

research. A research committee, to consider the problems of interest research, developed out of the round-table upon "The Measurement of Interests in Guidance," which was a part of the program of the Atlantic City meetings of the National Vocational Guidance Association. This committee was unanimous in the feeling that careful research should be stimulated to evaluate the present interest measures and interest concepts in psychology. As a step in this direction the committee planned a survey of existing problems, which were contemplated pieces of research,

or thought to be important problems by prominent research workers in the field of interest measurement. The results of this survey are published below, and the names of the contributors of the various topics are included to enable the person who may plan research upon a problem that is suggested to gain any further suggestions that the contributor may care to give.

This list of research topics is classified into various fields of interest research. Over fifty topics are included. While others might be added, the list indicates very well the present outlook in the measurement of interests.

THE REPORT OF INTEREST RESEARCH

A. THE DEVELOPMENT OF INTERESTS AND THEIR FOUNDATION IN TRAINING AND INHERITANCE

1. *The Crystalization of Interest Attitudes and their Future Constancy.* Using any interest inventory and the inventory scoring technique, research should attempt to discover at what age various "type" interests or general interest attitudes crystallize. By "type" interests are meant groups of attitudes found to be typical of lawyers, ministers, doctors or other professions. Upon discovery of the age that "type" interests crystallize a second problem would be to trace their development in the same individual over a period of years.—Karl M. Cowdery, *Stanford University*.
2. *Susceptibility of Interests to Training.* Are interests due to environmental conditions or to innate capacities? The investigation of such questions as the following should throw light on the problems: Do individuals who score low in medical interests develop interests in the field of medicine through training, and later rate higher in this professional interest? Do individuals who score low in a pro-

fessional interest tend to drop out of professional training more rapidly than those who score higher?—E. K. Strong, Jr., *Stanford University*.

3. *Range of Vocational Interests for Ages and Grades.* Many investigations have shown that school children tend to choose from a narrow range of occupations (chiefly the white collar jobs). Does this range increase or decrease with age (ages 6 to 22) and schooling (grades 1 to 16)?—H. D. Kitson, *Columbia University*.
4. *Discover the Main Types of Conflicting Interests to be met in High School and College.* What are the sort of common decisions which have to be faced? Are they between teaching and law, selling and nursing, etc., or between staying at home and going to college, getting engaged and earning a living, etc.?—J. B. Miner, *University of Kentucky*.
5. *The Stability of Interest Patterns.* The stability of interest patterns can best be determined by follow-up studies on young children into adolescence and maturity. The same inventory should be used at each level of investigation and various occupational scor-

ing keys should be applied at each level to determine the fluctuation.—*H. H. Remmers, Purdue University.*

6. *Age of Vocational Choice by Occupation.* At what age do people in various occupations define their occupational interest?—*H. D. Kitson, Columbia University.*
 7. *Effect Upon Interest Scores of Incidental Experiences.* In this study a group would be subjected to some pleasant or unpleasant experience corresponding to certain items in the interest inventory. For example, very hard problems might be assigned in mathematics accompanied each day by a general scolding for knowing so little about the work. Test before and immediately after the experience. Then test a month later to see if the effect was temporary.—*P. P. Brainard, University of Michigan.*
 8. *The Genesis and Rate of Change in Interest Patterns.* This problem can be experimentally attacked by determining the interests of children of a given age, social level, sex, etc., and then subjecting them to systematic instruction (e.g., "a course in vocations"). Differential results could then be studied in terms of scores on interest blanks which are made by an experimental instructed group compared with a control group not so instructed.—*H. H. Remmers, Purdue University.*
- B. INTERESTS AND ACHIEVEMENT
9. *The Development of Interests Based Upon Special Abilities.* Investigation might be made of the crystallization of interests around special group of abilities. Subjects might be selected at an early age by a standard special abilities test. Then interest inventories could be scored for this special group of abilities or for occupations requiring this group of special abilities. A comparative follow-up over a period of years by means of these measures would indicate the development of interests upon special abilities.—*E. K. Strong, Jr., Stanford University.*
 10. *Predicting Vocational Choice and Vocational Success from Interests.* Strong's Vocational Interest Blank might be given to a large number of college seniors, and scored for various professional interests. These individuals would be followed-up, upon securing a position, for choice, and five years later, for success. Probability tables could be made out from this data predicting vocational choice and vocational success from the interest inventory.—*Frank K. Shuttleworth, Yale University.*
 11. *Relation Between Levels of Professional Interests and Professional Aptitudes.* Determinations might be made of coincidence between levels of professional interests as determined by scoring keys applied to the interest inventory and levels of professional aptitude as measured by professional aptitude tests.—*Karl M. Cowdery, Stanford University.*
 12. *The Relation of Interests and "Aptitude".* The rôle of interests in determining "Aptitude" might be studied by the comparison of scores in the Stanford Scientific Aptitude Test, or Chemistry Test, or Mathematics Test, or any Mechanical Aptitude Tests, with scores in an interest inventory (which is scored for interests in a similar field). Strong's, or any other inventory, might be used for this purpose, and scoring keys could be devised upon contrasting groups with highest and lowest interests in the field under investigation.—*T. A. Langlie, Wesleyan University.*
 13. *Permanence of Interests and Relation to Achievement.* This research would compare the degrees of permanence of interests estimated at intervals of six months over a period of at least two years and measures of achievement in school subjects.—*J. S. Orleans, World Book Co.*

- C. IMPROVING THE INTEREST INVENTORY AND ITS SCORING
14. *Common Interests of Occupational Groups.* The investigation of common or like interests among individuals in various occupational groups, and other social groups, is needed to establish discriminating interests which might be included in the interest inventory. This might be done by developing interest inventories for the various occupational groups, and by trial upon samples of these occupational groups, eliminate those interests which are not common to that occupational group. This evidence would not only indicate interests characteristic of particular occupational groups, but interests common to larger vocational groupings.—*Douglas Fryer, New York University.*
 15. *The Interests of Tradesmen.* The development of scoring keys to score the interest inventory for trades such as carpenter, machinist, etc.—*E. K. Strong, Jr., Stanford University.*
 16. *The Reliability of Single Items of the Interest Inventory.* An inventory, such as Strong's Vocational Interest Blank, might be repeated several weeks apart and the correspondence between first and second reactions determined for each item. If certain items yield more consistent responses, such information should be of considerable help in revising the inventory or in constructing duplicate forms.—*Frank K. Shuttleworth, Yale University.*
 17. *The Correlation of Personal History Items with Separate Items of the Interest Inventory.* At the present stage of development of interest measurement it is more important that we know the nature of the human activities represented by the items of the interest inventory, than that we attempt the classification of people as "introvert," etc. Strong's or any list of interests, might be used as the basis for comparison with personal history items.—*W. H. Brentlinger, Oberlin College.*
 18. *Development of Equivalent Forms of Interest Inventory.* The same interest inventory might be presented several times with variations in the wording of items each time it is presented. The constancy of reaction to certain wordings rather than others would be indicated. Where the same reaction is general to two forms of wording, two forms of the inventory may be constructed.—*P. P. Brainard, University of Michigan.*
 19. *Refinement of the Method of Recording Interests.* Comparison of the method indicating likes and dislikes on a list of occupations, magazines, activities, etc., with the method of checking the direction of interest between contrasting working conditions such as indoor-outdoor, working alone—working with others, etc.—*J. B. Miner, University of Kentucky.*
 20. *Determination of the Characteristic Reactions of "Special Interest Groups" to the Interest Inventory.* Such organizations as the D. A. R., the Ohio State University "Holiness Society" (recently announced), the Volunteer Bands of denominational colleges, etc., represent material for this type of study. It is possible that the selection of distinguishing items forming an inventory for this purpose might be desirable, but the results from any interest inventory would be valuable.—*W. H. Brentlinger, Oberlin College.*
 21. *A Search for Universal Interests.* A survey of the literature upon interests might be made, particularly the older literature before measures of interests were developed, for suggestions of universal interests. Certain universal interests may be characteristic of various ages, races, nations and sex. Such a list of universal interests would indicate items to include in universal interest inventories and items not to include in interest inventories prepared to distinguish between social and occupational groups.—*Douglas Fryer, New York University.*
 22. *Universality of Interests as a Success Factor, in Sales and Executive Occu-*

pations. A Universal Interest Inventory like that used by Marrow would indicate the comparative universality of the interests in these occupations. The Strong Vocational Interest Blank, scored for various occupations, would indicate the extent to which these occupational workers have the interests of more specialized occupations.—*L. R. Frazier, Dennison Mfg. Co.*

23. *Scoring Keys for Salesmen.* The attempt might be made to develop scoring keys for the interest inventory upon the distinguishing interests (if such exist) of various groups of salesmen, such as salesmen who sell intangibles and salesmen who sell commodities.—*H. G. Kenagy, Life Insurance Sales Research Bureau.*
24. *The Determination of Aversions for the Interest Inventory.* The search for interest items characteristic of any clearly defined occupational group might be supplemented by a study of distinguishing aversions of that group. A man may be in a particular line of work because this vocation offers an escape, a retreat, from annoying situations that exist in other occupations.—*Richard S. Uhrbrock, Cornell University.*
25. *The Determination of Constellations of Interests Characteristic of Outstanding Students in the Arts and Sciences.* For the purposes of this research, it is suggested that Strong's Vocational Interest Blank should be filled out by 250 Phi Beta Kappa and 250 Sigma Xi men whose ages range from eighteen to twenty-three years. Results should be scored by the inventory scoring technique to reveal similarities and differences in interests.—*Richard S. Uhrbrock, Cornell University.*
26. *The Similarity of Interests at Different Levels of Ability.* This investigation would attempt to determine what occupations at different levels of ability have similar interests. Individuals of widely different abilities show similar interests. What occupations

satisfying similar interests are there to be recommended to individuals with similar interests but different abilities? Another approach would be to determine if the interests of occupations at the same level of ability show any similarity in interests.—*B. V. Moore, Pennsylvania State College.*

27. *A Comparison of the Objectivity of Interests as Determined by a Paired Comparison Machine and as Determined by Any One of the Usual Methods.* The paired comparison machine will present pictures, names of activities, etc., in pairs, to which the relative order of liking for alternatives can be estimated. The order determined by this method can be compared with the order secured by ranking cards, by placing ordinal numerals in front of the items of a list, and by any other method. This comparison will show if the ordering of interests is an objective procedure. The method showing the highest correlation with itself on a subsequent event is, presumably, the most objective.—*Herbert A. Toops, Ohio State University.*
28. *A determination of the control conditions, as to verbal or printed directions, etc., which best reveal interests.* Conceivably, one will arrive at somewhat different interests if one picks the item of a pair which he likes best or the item of a pair which he likes least; or the item of three which is "least innocuous"; and still a somewhat different result if he picks the item from among some five or half dozen alternative choices. Various other forms of testing device should be tried out under carefully controlled conditions. The tests used should have a reliability of fully 0.90.—*Herbert A. Toops, Ohio State University.*

D. DEVELOPING NORMS FOR THE INTEREST INVENTORY

29. *The Absence of Occupational Interests Among College Students.* Why do some college students not rate high

on any of the present occupational scales? This may be due to the fact that their interests are in some other line than occupations for which they can be scored. It may be due to the fact that there are some men who do not have the interests of any occupation or profession.—*E. K. Strong, Jr., Stanford University.*

30. *Occupational Shifts and Interests.* A long time study might be made of individuals to whom have been given the Strong Inventory and scored for various occupational interests (at college graduation). This study might develop predictive norms of possible shifts into the occupations for which highest interest scores were received.—*A. T. Poffenberger, Columbia University.*

31. *The Development of Age Norms for the Interest Inventory.* This is a study of both theoretical and practical application. Terman, Lehman and Witty, have developed age norms for play interests. Other studies might deal with interests over a wide range of social activities, indicating norms for interests in social activity.—*W. H. Brentlinger, Oberlin College.*

32. *The Differential Prediction of the Interest inventory within an Occupation.* Comparisons of degrees of occupational interests on Strong's scales might be made with degrees of achievement (either rated or measured by aptitude tests) in the various occupations for which such comparative measures have been developed.—*A. T. Poffenberger, Columbia University.*

E. OBJECTIVE METHODS OF MEASUREMENT

33. *Involuntary Movement as Diagnostic of Interests.* A study might be made of involuntary movement measured by an automatograph or planchette, while the subject is presented with descriptions or pictures, or even moving pictures of situations, or objects differing very widely in their presumed interest appeal. It is con-

ceivable that involuntary movement might serve somewhat to differentiate the subject's reactions to these different stimuli. It could be given to groups of individuals known to differ in some fundamental interest and movements analyzed to determine diagnostic value or differential scores.—*H. E. Burt, Ohio State University.*

34. *Measurement of Interests with Nonsense Materials by the Use of the Free Associations Method.* Ink blots, nonsense syllables, and nonsense figures might be used to stimulate free associations. The procedure in the trial of this measure would be similar to that followed by Jennie B. Wyman. (See Chapter XVI, "Tests of Intellectual, Social and Activity Interests", by Jennie B. Wyman in *Genetic Studies of Genius*, Vol. I, Stanford University Press.)—*Douglas Fryer, New York University.*

35. *Knowledge of Vocations as an Index of Interests.* An information test, measuring knowledge of six to ten major occupations, and scored to provide a profile of the subject's knowledge of these vocations might be helpful in indicating vocational interests for guidance purposes.—*Frank K. Shuttleworth, Yale University.*

36. *An Objective Measurement of Interests.* A test in which irrelevant words are to be crossed out of the text in which they occur, varies widely in its appeal. There might, for example, be some texts dealing with some social situations, with sports and amusements, With business and the like, and differential scores between different types of material worked out and correlated with known difference in interests, such as might be obtained by giving such tests to men versus women, business men versus professional men, engineers versus salesmen, etc.—*H. E. Burt, Ohio State University.*

37. *The Physiological Processes Involved in Being Interested.* An objective approach to this problem has been found through investigation of changes in secretions of the salivary glands. The

normal secretions of a subject when interested may be compared with secretions when engaged in activities in which he is not interested. Preliminary studies have shown that these secretions are totally or partially inhibited when the subject is actively at work on puzzles or tracing stars reflected in a mirror. With this method such factors as duration of interests, effect of rest pauses and the influence of fatigue upon interests may be objectively determined.—A. L. Winsor, Cornell University.

38. *A Comparison of Objective and Subjective Measures.* An information test of true-false, multiple choice or completion variety might be based upon the items of the interest inventory. Success and failure in the information test could be compared with like, indifference and dislike for the items of the inventory. A correspondence would indicate that the subjective measure and the objective measure of interests are related.—Douglas Fryer, New York University.

F. THE RATING SCALE

39. *The Degree of Interest in One's Occupation.* Measurement of degree of interest in one's occupation can be secured by means of a scale devised for this purpose on which the individual rates his interest in his occupation. With this technique, the average degree of interest which workers in one occupation have, could be compared with the average possessed by workers in any other occupation.—H. D. Kitson, Columbia University.

G. INTERESTS OF ABNORMALS

40. *The Relationship of Emotional Adjustments to Interest Patterns.* Abnormal Psychology and Psychiatry stress the doctrine that emotional adjustment (e.g., introversion vs. extroversion) leads to radically different interest patterns. This doctrine needs to be evaluated in terms of interest measurement. Instruments for measurement of emotional adjustment are

such inventories as Thurstone's Personality Schedule, the Woodworth Psychoneurotic inventory, or various adaptations of this latter that have been made. Interest patterns of various adjustment groups can then be determined by the interest inventory with its scoring technique.—H. H. Remmers, Purdue University.

41. *Comparison of the Interests of Normals and Abnormals.* The interests of various abnormal groups, such as depressed patients and dementia praecox (simple phase in particular) patients might be compared with the interests of normal groups to see if abnormal mentality is distinctively a difference in interests.—Douglas Fryer, New York University.

H. SOCIAL RACIAL, AND GEOGRAPHIC DIFFERENCES IN INTERESTS

42. *The Distinguishing of Racial Groups by Their Interests.* This piece of research would involve the development of scoring keys for the interest inventory which would be based upon any distinguishing interests of racial groups that might be found, such as Jewish and Gentile differences. The inventory and its scoring technique would be applicable to this problem.—Lorine Pruette, New York City.
43. *The Isolation of Geographical Differences in Interests.* It is quite possible and even likely that inland children, for example, will have interest patterns which differ significantly from those of children living near rivers or sea coasts. Other geographical differentia such as rural vs. urban, North vs. South, East vs. West, etc., would come under this general problem. Strong's occupational scoring procedure (possibly improved through the use of sorting and tabulating machinery) would probably be applicable to the study of this problem.—H. H. Remmers, Purdue University.
44. *The Interest Patterns of Social-Economic Levels.* The interest patterns of social-economic levels might be studied by means of the interest inventory

and its scoring technique. The division of the primary group upon which to develop the scoring key could be made by means of several scales of social-economic levels (e.g., the Minnesota scale, the Chapman-Sims scale, and the Chapman-Sims scale as revised by Heilman).—*H. H. Remmers, Purdue University.*

45. *The Measurement of the Interests of Negro Children.* The distinctive interests of negro children might be compared for various ability groupings, and social groupings, and they might be compared with white children of the same age and sex.—*Dagney Sunne, Tulane University.*

46. *Familial Similarities in Interests.* This research would involve the administration of an interest inventory to an adequate sampling of male siblings within definite age limits and the determination of degrees of like response for the various items of the inventory.—*L. Dewey Anderson, Western Reserve University.*

47. *Racial Differences in Interests.* Using "race" in the strict anthropological sense racial groups might be segregated by various anthropometric criteria, such as head shape, and compared for interest differences by means of the interest inventory and its scoring technique.—*G. H. Estabrooks, Colgate University.*

I. SPECIAL GUIDANCE PROBLEMS

48. *The investigation of Avocations for Special Types of Workers (Department store executives and salespeople, for example) by means of Interest Measurements.* Various types of interest

questionnaires might be presented to different groups of workers with the direction to check the activities that might interest them on the side, or as substitute activities on retirement. A compilation of present activities would serve to supplement this study. Such information could then be made the basis for guidance regarding profitable use of leisure time, and among those anticipating retirement.—*Natalie Kneeland, University of Pittsburgh.*

49. *Evaluation of Occupational Information Courses by Changes in Interest Scores.* Groups entering upon a course of study in occupations might be given an interest inventory, which would be scored for various occupations, before beginning the course and after completing it. Group scores and individual scores on each item might be compared.—*Paul P. Brainard, University of Michigan.*

50. *Evaluation of Occupational Experiences by Changes in Interest Scores.* Compare interest scores of a group before and after engaging in certain try-out courses.—*P. P. Brainard University of Michigan.*

51. *Determining Distinctive Interests in College Work.* This Research would attempt to determine the distinguishing interests of women college groups who select certain fields of educational training, such as the study of child development. Choices of subjects for college reports might be studied in the same manner.—*L. C. Wagoner, Vassar College.*

Manuscript received May 10, 1930

News Notes

PERSONNEL RESEARCH FEDERATION

In an effort to increase the service to its members, the Federation staff has made several changes in the Service Bulletin. The format has been improved and enlarged. The title is now Personnel Service Bulletin. Each issue contains a short article by an authority in the personnel field, as well as briefer notes aimed to help members to keep informed.

EMPLOYEE SUPERANNUATION

A research report, "Meeting the Cost of Employee Superannuation," prepared by the Committee on Industrial Relations of the National Metal Trades Association draws the following conclusions:

1. Provision for the care of superannuated employees, either through continued employment at minor tasks or through the operation of an actuarially sound and adequately financed pension system, is in complete harmony with the ideals of the National Metal Trades Association.

2. The operation of a sound industrial pension system is justified on an economic as well as a humane basis. Experience in other countries indicates that measures intended to relieve public old age dependency do not reduce the desirability of industrial pension plans.

3. No pension plan should be entered into recklessly and without careful study, nor without providing for competent actuarial supervision and sound accounting methods. Means of administration should be independent of the employing company.

4. No pension promise should be made which is based upon Management's hope of permanence and continuing prosperity. Instead, pension promises should be based solely upon the amount of money actually available for pension purposes.

5. Constant actuarial supervision is es-

sential to the success of a privately operated pension plan. However, since mortality and disability figures are based upon mass experience and future salaries and labor turnover rates are subject to so many varying influences, it seems inadvisable for any except the very largest employers to attempt to operate their own pension plans. Even then, there is the risk that the number of pensioners will be so small as to render improbable experience conforming to life tables. In small and medium sized plants, especially, employers would probably be well advised to delegate the operation of a pension plan to one of the various insurance companies that already have the organization, experience, and established accounting methods which are necessary for the operation of a sound plan.

REGULARIZING EMPLOYMENT

"Regularizing Employment," a report prepared for the Committee on the permanent Aspects of Unemployment of the A. I. C. P., outlines what is being done at the present time on this problem. Stating that efforts to stabilize employment emanate from four sources: 1. Business, 2. Community groups, including local and county officials, 3. The state and federal government, and 4. Private agencies and individuals, the report goes on to describe the steps being taken by these four agencies.

GIRL SCOUTS RATE CAMPS AND CAMP DIRECTORS

The Girl Scouts, Inc., is experimenting with scales for rating its camp directors and camps. A comprehensive rating scale prepared by the staff of the Personnel Research Federation is being tried out this summer in a mid-western region where the camping program is especially well developed. Evaluation in the fall will deter-

mine further steps and extension of this work, upon which it is hoped to base licensing and training programs. Agnes B. Leahy, Executive Secretary of the Personnel Division of the national Girl Scouts organization, is in charge of this development.

BOY SCOUTS PERSONNEL DEPARTMENT

Established June 1, 1927, the Personnel Department of the Boy Scouts of America has already made long strides forward under the directorship of Ernest A. Stowell.

The work of the personnel department consists of the recruiting of men for attendance at the national training school, the placement of these men after the completion of their course, the transfer and promotion of men of demonstrated ability and the elimination from the service of those whose records do not justify continuing their employment.

In the discharge of these duties for the year ending December 31, 1929, the personnel department recruited 157 men for attendance at the national training school, placed 126 of them in the service of scouting, advanced 149 men already employed in line of promotion, approved the employment and deferred the training of 31 other men under the 60-day provisional appointment plan, and filled 311 vacancies in the professional service throughout the country. The year ended with 45 positions still open.

During the year 162 men were introduced into the service in positions made possible by the normal growth of existing councils, the development of extension projects in 53 other councils, and the creation of 12 new councils. There were approximately 1,032 full-time employees in the professional service as of December 31, 1929.

Of 356 vacancies existing throughout the country during the year, 166 were caused by withdrawals from the service which involved the discharge of 97 men for incompetency.

BELOIT COLLEGE

Beloit College has established a personnel office in charge of an alumnus, the Rev. Edward W. Hale, formerly of New York City. Mr. Hale's duties include contacts

with the secondary schools and advice to prospective students; development of educational and vocational guidance services to students while in college; and oversight of senior and alumni placement and follow-up. He will act as staff officer and consultant with reference to all the activities of the college which are specifically directed toward educational and vocational adjustment throughout the entire period of the students' contacts with the institution.

SUGGESTED RESEARCH TOPICS IN COLLEGE PERSONNEL

"Two Hundred Research Problems for a Five Year Research Program into the College Entrance Problem" is the title of Ohio College Association Bulletin No. 61. In addition to the valuable mapping-out of the field of necessary research, which is extremely suggestive and stimulating, helpful hints are given for attack on problems and preparation of findings.

Anyone planning to write a dissertation in the college personnel field or to carry on such research for other purposes will do well to get a copy of this Bulletin.

NATION-WIDE STUDY OF ENGLISH USAGE

The Psychological Corporation is sponsoring a Nation-Wide Experimental Study of English Usage which is of interest from the viewpoint of testing technique as well as teaching methods.

It has been stated by authorities who have done research in this field that forty per cent of the rules which pupils now study are obsolete or non-essential, and are the cause of much confusion and failure to master English usage. These rules are largely ignored by the best writers. The elimination of non-essentials here does not involve any loss from the point of view of unity of expression or good usage, but promises better mastery of usage at the expense of less time and effort.

Special diagnostic tests are being prepared for the study covering one hundred phases of usage which have been found to present major difficulties. The tests are suitable for administration at any level above the Fifth Grade and to adults. The study aims to determine a more objective

and practical allotment of phases of usage for instruction in each grade and to improve understanding of instructional methods necessary for mastery of different phases of usage. The special diagnostic tests will be available for use next October. Schools throughout the country are being invited to participate in the study.

Inasmuch as the tests and the materials provide a prompt means for discovering errors in usage and suggest the most effective methods for correction and mastery, it is likely that they will be of interest to department stores and other business firms desiring to better the usage of English by their employees.

PERSONNEL CALENDAR

SEPTEMBER 9-12. *International Association of Public Employment Services*. Toronto, Canada.

SEPTEMBER 22-26. *International Association of Industrial Accident Boards and Commissions*. Wilmington, Delaware.

SEPTEMBER 29-OCTOBER 4. *Nineteenth Annual Safety Congress*. National Safety Council. Pittsburgh, Pennsylvania.

AUGUST 26-SEPTEMBER 6. *Hanover Conference*. Social Science Research Council. Hanover, New Hampshire.

AUGUST 27-31. *Silver Bay Conference on Industrial Relations*. Auspices National Council, Y. M. C. A. Silver Bay, New York.

OCTOBER 11. *Annual Business Meeting, Corporate Members*. PERSONNEL RESEARCH FEDERATION. New York City.

NOVEMBER 14-15. *Annual Fall Conference*. PERSONNEL RESEARCH FEDERATION. New York City.

PERSONAL ITEMS

DR. J. McKEEN CATTELL, distinguished psychologist, was recently presented with a gold medal by the Society of Arts and Sciences. Two medals are awarded annually for outstanding accomplishment in science.

GRACE E. MANSON has joined the faculty of Northwestern University as Associate Professor of Psychology and Assistant Director of the Personnel Bureau. Dr. Manson will divide her time between teaching courses in Mental Measurements and Social Psychology, and coöperating in the activities of the Personnel Bureau.

EDWARD J. SPARLING has accepted a position as vocational counselor and Assistant Professor of Vocational Guidance at Long Island University, Brooklyn, N. Y. This institute, which has been organized only three years, has already developed a thriving Department of Personnel which serves its 1400 students. The Bureau is under the direction of Dr. Robert C. Whitford.

Personnel Books

EDITED BY DOUGLAS FRYER

This issue of Personnel Books emphasizes the application of the scientific method to industry's personnel problems. In the October issue the aim will be again to represent the breadth and variety of personnel activities through reviews of published books. Plans are to emphasize in the December issue the application of the scientific method to the problems of vocational guidance, as there are many excellent books appearing this year which discuss these activities. The leading review of this issue deals with wage incentives, which is becoming more and more a problem for scientific analysis. All the studies of motivation in psychology, some of which are reviewed from time to time in these columns, have a practical bearing upon this problem. According to Edward S. Cowdrick, the present-day philosophy of the Taylor Society upon industrial relations is reflected in the book by that organization which is reviewed here. Monard V. Hayes shows us the up-to-date point of view in the use of accountancy, according to LeRoy E. Kimball, and Meyer Bloomfield emphasizes the importance of the system of tribunals known as the Impartial Chairman. In "Briefer Mention" there are a number of the leading recent books in the field of economics, which are reviewed for these columns by Margaret Myers. This issue includes "New Books" published during April and May.

WAGES AND WORK

WAGE INCENTIVE METHODS, THEIR SELECTION, INSTALLATION AND OPERATION. By Charles Walter Lytle. New York: Ronald, 1929, v + 457 pp., \$7.50

Reviewed by HAROLD E. BURTT, *Ohio State University*

The book is a thorough-going critical review of the whole matter of wage incentive in industry. The introductory chapter sketches the general advantages of incentives and cites frequent and marked increases in production. It presents results of various surveys and questionnaires, bringing out the fact that almost half the industries investigated were using some

type of incentive plan, and those which had adopted one kept on using it.

The second chapter on "Classification of Incentives Plans" gives a birdseye view of the whole problem. The author suggests a general classification on the basis of (1) immediate stimulation of effort, (2) long time stimulation for team work. Getting down to financial incentives, he classifies

them according to whether (1) the employer takes all the gain or loss, (2) the employee takes all the gain or loss, (3) the gain is shared, (4) empirical location is made of points between the two variables. He gives diagrams showing how most financial incentives involve the same two variables—time wages and wages saved, but with different weighting.

When it comes to selection of the plan (Chapter III) we must consider quality, quantity, and economy of materials, and their relative importance in the particular job in question. The author feels that incentive is not a cure-all, and that good management is necessary. Numerous charts and tables show the total cost of various incentive plans. The aim is to hold the maximum number of employees near their maximum production. There is an analysis of various justifiable plans with information as to why and how. In this manner the author selects ten fundamental plans, such as day rate, multiple time, high piece rate, etc., and claims that these provide us with every kind of incentive which we need.

The following chapters go into a more detailed consideration of these various plans. Among the problems discussed are group incentive plans, setting base rates, studying individual job rates, making a premium for versatility, that is, a bonus, if the worker acquires proficiency in any other class of work than that in which he is engaged. The point is also very wisely stressed that definite policies of this sort should be announced and posted so that everyone knows exactly what is happening. Then follow discussions of the installation of incentive plans, time rate plans, single rate plans, combined time bonus and piece rate plans, and profit sharing plans with their distinctive advantage in the psychological effect of feelings of partnership.

Then we have a consideration of other incentive plans supplementary to production. If a beginner, for example, goes on a piece rate he is apt to be discouraged. We

need flexibility because of these individual differences, particularly in the early stages of training. Specific promotion scales for apprentices are desirable. Then we may reward the individuals for quality, although this is not so general a factor now that the work is so well standardized. Reducing waste is sometimes rewarded and we likewise have prizes for suggestions, for waste elimination, and sometimes for attendance. The incentive plans may even be extended to indirect work and supervision, for example, the amount loaded, or, the number of packages handled, or, gas saved per mile. Even with inspection work we may get incentive by the use of super-inspectors.

Finally, even for supervisors, office employees and executives, incentives are possible. For the former the bonus is usually in terms of what his group does. In office work we may score employees on errors in work or on number of typewriter keys struck. Profit sharing is one of the best types of incentive for executives. The appendix gives methods for studying incentive plans in detail.

The book on the whole is an erudite piece of work. It goes into a great many of the incentive plans that have been tried, analyzes them in considerable detail, and shows their possibilities and short-comings. The book naturally deals more with the statistics of the plans rather than with any psychological analysis of the incentive. For instance, we read about the need of leadership for the group incentive plan, but have little suggestion as to how to get the leader or what constitutes leadership. The treatment is replete with quotations from various men in industry. It requires rather careful reading, for there are no chapter summaries and there is a wealth of tabular and statistical detail. On the whole, while it contains little of interest to a psychologist, from a purely theoretical standpoint, it is replete with facts which should be of considerable value to the business man. One who is in the front line certainly will find it worthy of study.

AFTER TAYLOR

SCIENTIFIC MANAGEMENT IN AMERICAN INDUSTRY. By The Taylor Society. New York: Harper, 1929, xix + 479 pp., \$6.00

Reviewed by EDWARD S. COWDRICK, *New York City*

In 1928 the Taylor Society undertook the preparation of "a comprehensive treatise on scientific management." The project was mapped out by the national organization and the different topics were assigned to more than twenty authors, each considered an authority in the particular field in which he was to work. Naturally, in covering so broad a subject within the limits of a single volume, the authors have in most cases confined themselves to brief and somewhat abstract discussion. A few sections, however, have been expanded to include a degree of detail comparable to that usually found in works of the "handbook" type. This detailed treatment is found, for example, in the chapters on "Classification and Symbolization" by Morris Llewellyn Cooke; on "General Administrative Standards" by Howard Coonley and Joseph H. Barber; on "Merchandising Standards" by John S. Keir and Henry S. Dennison, and on "Factory Operation Standards" by Leslie E. Bryant and G. E. Schulz.

As was to be expected in a book prepared under the direction of the Taylor Society, the subject of research is treated adequately and authoritatively. "If management is to be in any sense scientific, it is essential that administrative decisions be based on investigation and analysis of facts rather than on the arbitrary and hasty edicts of officials," says Robert W. Burgess in the opening paragraph of his chapter on "Research for General Administration." This ideal of management based upon accurate knowledge and investigation is carried out in later chapters in which the authors discuss research as applied to production, merchandising and selling, clerical operations and personnel.

On the subject of personnel, the book may fairly be looked upon as reflecting the present philosophy of the Taylor Society as to the relationship between employees and

management. In the very last chapter Robert Bruere attempts to trace the development of this philosophy. In the earlier activities of Frederick W. Taylor he finds little indication of regard for conditions surrounding the workingman. "As to shop conditions, for example, there is no word in Taylor's writings about the need for making the workshop a fit and pleasant place for men to work in. In his 'On the Art of Cutting Metals' he lists as one of his discoveries the high advantage of supplying water to cutting tools. Nowhere in Taylor's writings is there any reference to that whole range of problems which is concerned with supplying the workers with safety, or cleanliness, or good lighting, or any of the things which come within scope of industrial hygiene. Because of his preoccupation with the mechanical equipment, Taylor inevitably thought of the workmen almost exclusively in terms of skill, application and production, rather than in terms of personality. In saying this, I want very particularly to avoid the impression that Taylor was lacking in a sensitive regard of the men with whom he worked. We must be historically minded and recall that his books were written twenty-five and thirty-five years ago. The pioneering idea was still strong upon the American community. To be able to do the day's job under rough conditions was a test of the manly virtues."

Mr. Bruere apparently suspects that toward the end of his life Taylor himself began to conceive industrial relations in a sense somewhat resembling that of the present day. "Had Taylor lived, the logic of his own techniques would undoubtedly have led him on to a thorough consideration of all these problems of individual and group psychology as matters of high importance in themselves and having a controlling effect upon economically and socially efficient

production. For this his life was too short. As a matter of fact it was the Taylor Society which took up his educational work, that enlarged the perspective."

It is thus by building upon the Taylor tradition a superstructure of psychology, sociology and ethics that the Taylor Society has made conspicuous contributions to the new science of industrial relations. Throughout its changing philosophy it has insisted that labor management should be closely tied into the productive and distributive processes of industry. This conception is well illustrated by the several chapters on industrial relations in the present book. In his discussion of "Personnel Research," Ordway Tead outlines a number of investigation projects, all closely related to the needs of production. C. S. Yoakum contributes a chapter on "Labor Stand-

ards," in which he outlines psychological, trade and aptitude tests that have been found advantageous in fitting workers to the needs of industry. Mr. Tead reenters the forum in a stimulating chapter entitled "The Maintenance of Labor Standards," which really is taken up mainly with a discussion of the labor audit. The book (properly enough, perhaps, in view of its scope) contains only occasional and usually casual references to the more philosophical aspects of personnel administration, such as joint relationships, economic safeguards, and the mutual responsibilities of employers and employees.

In style and content the book manifests less variation among its contributors than is usual in a symposium, thus evidencing the skillful and scholarly editing by Dr. Harlow S. Person.

MANAGEMENT'S HANDMAIDEN

ACCOUNTING FOR EXECUTIVE CONTROL. By Monard V. Hayes. New York: Harper, 1929, 495 pp., \$6.00

Reviewed by LEROY E. KIMBALL, *Comptroller, New York University*

The objectives of ACCOUNTING FOR EXECUTIVE CONTROL can best be stated by quoting Mr. Hayes when he says at the end of the second chapter that they are:

1. To set forth a concept of accounting which may serve management as the basis for "control."
2. To discuss ways and means of setting up certain standards in business by which performance may be directed and appraised, and control of a business may be secured.
3. To discuss ways and means of keeping account of certain business accomplishments in terms of standards.
4. To discuss ways and means for accomplishing the following: (a) To determine causes for variation between standards and actual accomplishment. (b) To analyze the causes of variation and interpret them so as to place effectively responsibility and authority for performance. (c) To show how efficiency may be effectively determined for management use.

5. To discuss certain organization methods and procedure for the business enterprise, and to show how authority and responsibility may be effectively placed for purposes of control.

Mr. Hayes, a consulting management engineer with a well known company of management engineers, has incorporated a wealth of material in thirty-two chapters of his book and follows these with fourteen pages of bibliography, by chapters, which in itself should be of solid assistance to those interested in securing leads for further study of the various phases of the subject.

In his foreword, Professor Roy B. Kester says "the accounting office has always been the place where most of the significant financial facts of business have been recorded. To expand its field of activity and function, under the direction of a controller, to include the gathering and preparation of data, not strictly financial but almost

equally significant and important, is in accord with the best modern practice, which makes use of an established agency with a personnel already trained, rather than building up a new with the possibility of duplication. Thus controllership organization has been developed and has proved itself worthy of its trust."

Before dealing with how the controller's office should be organized to perform its duties, the author leads up to it logically with a discussion of the aim of management, the concept of accounting and the agencies necessary for management control. After the control is established, he shows the "services which accounting can make available to the various executives—chief and subordinate—on whom rests the management of a business enterprise."

Mr. Hayes visualizes the person in con-

trol as a technician who operates the mechanisms for determining the direction, the rate of speed, the resistances, and the results accomplished in a business enterprise. He believes he should provide the ways and means for the business experiences to be so recorded and so visualized that those charged with the responsibility may know how to operate the business machine at a maximum of efficiency. The tools of the controller are given as: (1) the budget; (2) general accounting; (3) financial accounting; (4) statistics; (5) verification or audit; (6) reports of many kinds.

This book should be equally important to accountants interested in broadening their professional usefulness to include problems of organization, and to executives looking for a clear and full statement of how a control system should function.

LABOR TURNS CAPITALIST

THE LABOR BANKING MOVEMENT IN THE UNITED STATES. Princeton University, Industrial Relations Section, 1929, xi + 377 pp., \$2.50

Reviewed by MARGARET G. MYERS, Columbia University

When the first labor banks were organized, at the crest of the prosperity which followed the war, they were hailed on the one hand, by labor sympathizers and radicals as a method by which labor was at last to free itself of capitalist domination; and on the other hand, by conservatives who foresaw the end of the "class struggle" as labor turned capitalist. At the same time the movement was opposed by such diverse groups as the old guard of the American Federation of Labor, which insisted that more than labor banking was needed to usher in a strikeless Utopia; and by Communists who viewed the labor bank as just one more red herring across the path of the working class. None of these exaggerated hopes and fears has been justified by the course of events. The number of banks increased between 1920 and 1926, from one to thirty-five, and the total capitalization reached the respectable sum of nine millions. But during the next three years

several important banks failed; others passed into the control of non-labor groups, and few new labor banks were organized. By the middle of 1929, the number of banks had been reduced to twenty-two, and the movement seemed to be in a period of slow decline.

This volume is the first impartial attempt to appraise the results of labor banking. The history of every bank is traced from its beginning to its end or its present status, as the case may be. The conclusion, which is almost reluctantly presented by the authors, is that labor banks as a class have not been successful. A few outstanding examples like the Amalgamated Bank of New York, are not sufficient to bring up the average. From the banking point of view, difficulties have arisen from the inexperience of officers and directors, and from the frequent conflict between the interest of sound banking and the interest of the labor group which held control. Many of the banks

have not been able to earn a fair rate of return on their capital, and others have suffered an impairment of capital. Nor have the labor banks been more successful in serving the interests of labor than in making profits as banks. A few instances can be cited, in which a labor bank aided a union during a strike, or loaned to a fair employer, or saved a closed-shop employer who had been unable to borrow from commercial banks. Some of the banks started out with the hope of catering particularly to the banking needs of the workers, by specializing in

small loans, or by increasing the interest paid to savings depositors, but most of these special services have had to be abandoned. Labor has secured little in the way of service from its banks, and except for a few cases, nothing in the way of prestige. Such disasters as overtook the banks controlled by the Brotherhood of Locomotive Engineers did serious harm to the cause of labor. On the whole the picture is a discouraging one, and the few bright spots only serve to set the failures in darker relief.

A "MUST" FOR MANAGEMENT

PRESENT DAY LABOR RELATIONS. By Paul F. Gemmil. New York: John Wiley, 1929, vii + 312 pp., \$3.00

Reviewed by MEYER BLOOMFIELD, *New York City*

The student of industrial relations always welcomes such a clear and discriminating appraisal of typical employer-employee plans as Dr. Gemmil's book presents. The subject can never be so trite that fresh evaluations, especially in terms of well-selected plans, are likely to be passed by.

From the side of management, however, which needs so much to keep posted and to be intelligent in thinking on this subject there is a curious tidal action as regards an interest in labor relations. There is one type of executive, and the name is not Legion, which, regardless of labor market fluctuations, looks on a sustained program of labor relations as a normal ingredient of management policy. Another type classes an interest of this kind as a luxury when no pressure supervenes, and an emergency, when relationship realities have to be faced. The big problem in modern executive training is how to make such a study as Dr. Gemmil's take its place, where it truly belongs, among the "musts" in managerial practice.

This book is divided into three main sections: Trade Unionism, Employee Repre-

sentation, and Industrial Democracy. Each is treated with clearness and breadth. A reviewer, however, would at once take himself out of the blessed reviewer guild if he failed to indicate how he would, and how much better he could, have assembled the main topics for this compact study. So merely for franchise purposes, it is recorded here, that perhaps the most significant activity in labor relations today is the system of tribunals known as the Impartial Chairman, now functioning so brilliantly in the vexed ready-to-wear industries. This reviewer would have given almost all the space of the Employee Representation section to a study of these tribunals and their cases and decisions—a study of a labor Common Law in the making.

The fact still remains that Dr. Gemmil has made a contribution to sound thinking and insight. When the tide again turns toward a serious facing of labor relations programs—more generally than is the case when deflations, economic, intellectual and spiritual are the rage—his book will be among the first to be recognized for its industrial rehabilitation helps.

THE INDUSTRIAL HEALTH RESEARCH BOARD OF GREAT BRITAIN

NINTH ANNUAL REPORT OF THE INDUSTRIAL HEALTH RESEARCH BOARD TO DECEMBER 31, 1928. London, His Majesty's Stationery Office, 1929, 33 pp. (9 d.)

(All the reports listed below were published during 1928 and are obtainable at H. M. S. O., London)

TWO CONTRIBUTIONS TO THE EXPERIMENTAL STUDY OF THE MENSTRUAL CYCLE. I. ITS INFLUENCE ON MENTAL AND MUSCULAR EFFICIENCY. By S. C. M. Sowton and C. S. Myers. II. ITS RELATION TO GENERAL FUNCTIONAL ACTIVITY. By E. M. Bedale. Report No. 45. 73 pp. (2 s. 6 d.)

A PHYSIOLOGICAL INVESTIGATION OF THE RADIANT HEATING IN VARIOUS BUILDINGS. By H. M. Vernon and M. D. Vernon, assisted by Isabel Lorrain-Smith. Report No. 46. 60 pp. (2 s. 0 d.)

TWO STUDIES ON HOURS OF WORK: I. FIVE-HOUR SPELLS FOR WOMEN, WITH REFERENCE TO REST PAUSES. By H. M. Vernon and M. D. Vernon, assisted by I. Lorrain-Smith. II. THE TWO-SHIFT SYSTEM IN CERTAIN FACTORIES. By May Smith and M. D. Vernon. Report No. 47. 35 pp. (1 s. 3 d.)

ON THE RELIEF OF EYESTRAIN AMONG PERSONS PERFORMING VERY FINE WORK. By H. C. Weston and S. Adams. Report No. 49. 31 pp. (1 s. 3 d.)

THE PHYSIOLOGICAL COST OF THE MUSCULAR MOVEMENTS INVOLVED IN BARROW WORK. By G. P. Crowden. Report No. 50. 24 pp. (1 s. 0 d.)

A STUDY OF ABSENTEEISM IN A GROUP OF TEN COLLIERIES. By H. M. Vernon and T. Bedford (assisted by C. G. Warner), Report No. 51. 68 pp. (2 s. 6 d.)

THE COMPARATIVE EFFECTS OF VARIETY AND UNIFORMITY IN WORK. By S. Wyatt and J. A. Fraser. Report No. 52. 36 pp. (1 s. 3 d.)

THE USE OF PERFORMANCE TESTS OF INTELLIGENCE IN VOCATIONAL GUIDANCE. By F. M. Earle, M. Milner and others. Report No. 53. (2 s. 6 d.)

AN INVESTIGATION INTO THE SICKNESS EXPERIENCE OF PRINTERS (WITH SPECIAL REFERENCE TO THE INCIDENCE OF TUBERCULOSIS). By A. Bradford Hill. Report No. 54. (4 s. 6 d.)

Reviewed by LELAND W. CRAFTS, *New York University*

The Industrial Health—formerly the Industrial Fatigue—Research Board of Great Britain continues to be the most elaborate and the most intensive existing enterprise for the study of the psychological and physiological problems that arise in industry. Its published contributions to the research problems which the Board had under investigation during the year 1928 will be briefly described and its plans for the immediate future indicated.

Effect of menstruation upon the working capacity of women. Two studies deal with the relation of the menstrual cycle to the working capacity of women. In one investigation various tests of mental and muscular efficiency were given daily, over periods of from six to nine months, to a

group of university students and factory operatives ranging in ages from 17 to 22 years. In the other, systematic observations of basal-metabolism, body temperature, blood pressure and pulse rate were made on a single subject for a period of three months. The combined results of these two studies indicate that while in some individuals slight variations in efficiency and activity do occur during the menstrual cycle, the phenomenon has as a rule no appreciable effect on the working capacity of normal healthy women. Hence the important practical conclusion that whatever may be the disadvantages suffered by women in comparison with men in industry, the periodic occurrence of menstruation is not one of them.

Hours of work for women. Two researches in this field also have been completed. In one the efficiency of an unbroken five-hour spell in such factory work as packing tea, making biscuits and confectionery, labeling, tying packages and hemstitching was investigated. As might be expected it was found that the introduction of a rest pause of 10 to 15 minutes at the middle of the spell measurable increased output and—what was equally important—greatly decreased labor turnover. The second study deals with the effects on rate of output, loss of working time, absenteeism, sickness and labor turnover of the two-shift system. Under this system women may be employed between 6 a.m. and 10 p.m. in two shifts averaging not more than eight hours each, as compared with a working day of 8 a.m. to 5 p.m. The few data thus far assembled suggest that neither system has any advantage over the other.

Relief of eye strain in very fine processes. Investigation into the value of having specially constructed glasses worn by employees whose work demands fineness of visual discrimination and close vision, specifically in the processes of mounting lamp filaments by hand and drawing-in weaving, has been continued, and again their value has been effectively demonstrated. Output was increased on the average about 12 per cent, an amount which more than offsets the cost of the glasses, and the opinions of the workers themselves were favorable without exception. In many industries there are operations, such as, embroidering, burling and mending woollen cloth, examining finished products for minute defects, in which under ordinary conditions the eyestrain suffered may be considerable. The above results should suffice to persuade employers that there exists here a situation which could be remedied by a very small expenditure and with distinct advantage to themselves.

Efficiency in barrow work. A research on the energy expenditure, measured in terms of excess of oxygen consumed, in wheeling bricks has been completed. The results show that, with a barrow of a certain particular design, maximum efficiency depends on the arrangement as well as the weight

of the load, on the length of uninterrupted runs (since starting and stopping the barrow consume a great amount of energy), on the height of the handle relative to the worker's stature, and on the speed of wheeling, the most favorable rate being a brisk walk. Hence, even in such simple muscular work as this, worth-while economies could be effected by attention to differences in the physique of individual workers and by definite instruction of the latter in those "best methods" of work which this investigation has shown to exist.

Variety vs. uniformity in work. In this research two problems were investigated: the effect upon output of varying vs. uniform procedure among girls working at soap wrapping, handkerchief folding and bicycle chain "drifting;" and the optimum duration of unvaried activity in tobacco weighing and cigarette making, which are correlated processes commonly performed by a pair of operatives each of whom changes places at times with the other. The results indicate that an unvarying procedure is less productive and also causes increased irregularity in the rate of work. The highest output was obtained when the form of activity was changed every one and one-half or two hours, and in repetitive work of a distinctly fatiguing nature such changes should be even more frequent. However variations thus introduced must not be too frequent and must not interfere with the "swing" of the occupation. It seems fair to conclude, therefore, that we have here a problem whose solution, though clear enough in general principle, would differ in its actual details in different types of work.

Methods of heating. The work in this field during the past year has dealt with the physiological effects of certain forms of radiant heating, particularly of the widely used panel heating in which concealed coils of hot water pipes run in the ceiling, walls or floor of the room. The results suggest that the chief advantage of such heating is the remarkable uniformity of room temperature induced by the radiation of heat in all directions from large surfaces which themselves need be maintained at only a moderate temperature. Such systems do not, however, possess any inherently advan-

tageous qualities such as would, for example, enable them to bring about comfortable conditions at lower air temperatures than other devices could.

Absenteeism among miners. A statistical study has been made of the records of absenteeism over periods of 21 months to 6 years of some 23,000 miners working underground in a group of ten collieries in the same district. The data show that absence, whether voluntary or due to sickness and accident, is influenced by the temperature and air velocity in the pits, the age of the worker, the distance of his home from the mine, etc. The conclusions are, however, only tentative and further investigations are planned.

Sickness among printers. The incidence of sickness in the printing industry was determined and found to compare favorably with that among the insured working population in general. Within the industry itself, however, it was discovered that among compositors illness was exceptionally prevalent during the first few years of insured employment. Further investigation must determine whether this high sickness rate is due to the employment of individuals of poor physique or to unfavorable working conditions.

Vocational guidance. Another research recently published deals with the use of performance tests of intelligence. Such tests were given to large numbers of children and the results subjected to statistical

analysis. The relation between the test scores and success in certain manual trades is indicated.

In addition to summaries of the investigations reviewed above the 9th Annual Report of the Industrial Health Research Board calls attention to many researches now in progress. Among these are studies of the effect on working efficiency of illumination, noise and vibration, and humidity; investigations into the causes of accidents, labor turnover and sickness in various industries; data as to the incidence of neuroses among the working population; studies of the physique of men in industry; derivation of learning curves for different occupations; the development and application of tests for vocational guidance and selection; laboratory experiments in energy expenditure during muscular work in women, transfer of training, and the relation of age to the acquisition of skill. The Board now feels, and quite rightly, that its researches have already yielded conclusions possessing both scientific certainty and practical worth. Hence it recommends that in each industry a committee representative of both employers and workmen should be formed for the purpose of examining and applying the results of its work and for suggesting further problems. Such a step would of course greatly increase the scope and importance of its activities.

Briefer Mention

THE FIVE-DAY WEEK IN MANUFACTURING INDUSTRIES. New York: The Nat'l Indus. Conf. Bd., 1929, xi plus 69 pp., \$1.50.

The five-day week is a question not only of social reform but of individual factory management, and it is of the latter that this volume reports. The change to a five-day schedule involves many problems of administrative policy. Some of the establishments have retained the same number of working hours as under the former full week schedules; the greater number reduced the

hours, but only one-fourth reported any decrease in production. The adjustment of wage scales had depended upon conditions in the individual plant.

Among the positive advantages of the five-day week, employers have found reduced overhead costs, operating economies, smaller labor turnover, and improved morale. The chief disadvantage has been the longer working day which resulted when the former length of working week was retained and divided among the five days of the new schedule. Employees are uni-

formly in favor of the five-day week, and employers are seldom opposed to it after a trial unless it was forced upon them by a labor union against their will.

INVESTMENT TRUST ORGANIZATION AND MANAGEMENT (Rev. Ed.) By Leland Rex Robinson. New York: Ronald, 1929, xvii plus 608 pp., \$7.50.

This book, although originally published in 1926, has been completely re-written. It contains descriptions of the various kinds of investment trusts, the laws under which they are organized, and a brief summary of the investment trust movement in America. For the practical guidance of those who are organizing or managing such trusts, there are chapters on the problems of investment policy, the handling of securities, accounting, and taxation. For the general investing public, there are chapters on capital structure, forms of securities issued, earnings, and other subjects which should enable them to compare one investment trust with another, and choose their investment trust securities more wisely.

THE POST-WAR UNEMPLOYMENT PROBLEM. By Henry Clay. London: Macmillan, 1929, x plus 208 pp., \$3.40.

Post-war unemployment in England is largely a legacy of the war, the principal factors being the deflation policy of the Government which accompanied the return to the Gold Standard, and the dislocation of industry brought about by the war's interference with the export trades. Building subsidies and protective tariffs cannot bring about a permanent solution, and a new inflation would merely postpone it. What is needed is "rationalisation" of industry, by which industrial combinations are achieved with the object of securing productive economies and thus reducing costs, enabling England again to compete in the international markets. Labor costs must be reduced, not by reducing wages, but by removing restrictions on output, and so forth. Rationalisation should first be applied to the coal industry, which has been one of the heaviest sufferers from unemployment. If private enterprise has not the will to apply the remedy, the Government will be obliged to step in.

MEXICAN LABOR IN THE UNITED STATES.

By Paul S. Taylor.

1. *Imperial Valley.* 94 pp., \$1.15.

2. *Valley of the South Platte.* 141 pp., \$1.80.

3. *Migration Statistics.* 18 pp., \$.25.

Berkeley, California: Univ. of Cal. Press, 1929.

In the first two of these monographs, the place of the Mexican laborers in the fruit farms and cotton fields of the Imperial Valley, and the beet fields of northeastern Colorado, is described with special reference to their position in the community. The problem of Americanizing them and getting their children into schools, is made difficult not only by their own indifference, but also by the contemptuous disregard of their American neighbors. Social and economic isolation is the lot of these workers.

The third monograph analyzes and criticizes the statistics of Mexican immigration into the United States, and points out the dangers of basing immigration legislation upon such faulty data.

UNEMPLOYMENT INSURANCE IN GERMANY.

By Mollie Ray Carroll. Washington: Brookings Inst., 1929, x plus 137 pp., \$2.00.

The new German law of 1927 provided unemployment insurance for workers in many specified industries, up to a maximum of twenty-six weeks of unemployment. Contributions to the fund are compulsory for employers and employees, but may not exceed one and one-half per cent of wages from each side. Special assistance is given from the public treasury when necessary. The Act is administered through local labor exchanges created by it, which keep close supervision over the unemployed worker and make every effort to provide him with a job. The benefits range from thirty-five to seventy-five per cent of the average weekly wage, with supplementary allowances made for dependents. In spite of the care with which the Act was drawn, many difficulties have arisen in its application, especially in connection with the seasonal industries. Unemployment insurance is an essential safeguard to the worker, but it cannot solve the larger questions which depend upon the development of markets and improvements in industrial management.

THE HISTORY OF ECONOMICS. By Othmar Spann. (Trans. from the German by Eden and Cedar Paul) New York: Norton, 1930, 328 pp., \$3.50.

This volume by the Professor of Sociology and Economics at the University of Vienna, went through nineteen editions in Germany, and may be taken as representative of a large body of current economic opinion on the Continent. Although it discusses the different historical schools of economic theory, it has a very definite attitude of its own. Protest is voiced against the individualism of the "natural rights" school with its justification of ruthless competition, and against the current emphasis upon the pecuniary aspects of economic life. Opposite the title page the author has written: "Political Economy is not a Science of Business but a Science of Life."

A NEW ECONOMIC ORDER. Edited by Kirby Page. New York: Harcourt, Brace, 1930, 387 pp., \$3.00.

The book opens with debates on the four most discussed forms of economic organization—capitalism, socialism, communism, and Fascism. Two chapters are devoted to different theories of the technique of social reform, and the rest of the book is devoted to "Ways of Transforming the Present Competitive System into a Coöperative Order," which is assumed to be the social desideratum. Each of the fourteen "ways" is dis-

cussed by an expert in his field; among them are the minimum wage and family allowance, social insurance, workers' education, and trade unionism.

IMPERIALISM AND WORLD ECONOMY. By Nikolai Bukharin. New York: Int'l. Pub., 1929, 173 pp., \$2.00.

This essay, which bears an introduction by Lenin, is a study in Marxian economics. Imperialism is defined as an extension of the principles of capitalist development to international growth. The existence of world commodity markets and world capital markets is cited as evidence that the Marxian theory applies to international as well as to national events. The whole essay is an example of how the Communist formula may be applied to almost any subject.

ASPECTS OF EUROPEAN ECONOMICS AND RECONSTRUCTION. By William H. Scheffey. Los Angeles: Wetzel, 1929, 310 pp., \$3.00.

This collection of short articles appeared originally in 1926 and 1927, in the Chicago Journal of Commerce and the Boston Transcript. They describe the important economic events which were taking place in Europe during those years—stabilization of the currency in Germany, the general strike in England, the effort to balance the budget in France, and the industrial advance being made in Italy and Spain. Russia is the only important country omitted.

New Books

LABOR RELATIONS

CAPITALISM, SOCIALISM, COMMUNISM? By E. R. A. Seligman, Fenner Brockway, Scott Nearing. New York: Rand, 1930, 64 pp., 50¢.

INDUSTRIAL ARBITRATION IN GREAT BRITAIN. By Lord Amulree. New York: Oxford, 1930, x + 224 pp., \$4.50.

THE IMPERIALIST WAR, THE STRUGGLE AGAINST SOCIAL-CHAUVINISM AND SOCIAL-PACIFISM, 1914-1915. By Nikolai Lenin. New York: Int'l. Pub., 1930, 496 pp., \$4.50.

REDS AND LOST WAGES. By Charles G. Wood. New York: Harper, 1930, 295 pp., \$4.

OCCUPATIONAL ANALYSIS

ACOUSTICS OF BUILDINGS (2nd ed.). By F. R. Watson. New York: Wiley, 1930, 155 pp., \$3.

AVIATION AND LIFE INSURANCE: A STUDY OF THE DEATH RATE AND THE HAZARD OF FLYING IN RELATION TO POLICY UNDERWRITING. By Ray A. Dunn. U. S. A. Air Corps, 1930, 112 pp.

IS IT SAFE TO WORK? By Edison L. Bow-
ers. Boston: Houghton, 1930, 242 pp.,
\$2.50.

WOMEN AND THE PH.D.: FACTS FROM EX-
PERIENCES OF 1025 WOMEN WHO HAVE
TAKEN THE DEGREE OF DOCTOR OF
PHILOSOPHY SINCE 1877. By Emilie J.
Hutchison. Greensboro: N. C. Col. for
Women, 1930, 212 pp., \$1.

COLLEGE PERSONNEL

QUANTITATIVE MEASUREMENT IN INSTITU-
TIONS OF HIGHER LEARNING. By Stuart
A. Courtis, ed. Chicago: U. of Chicago,
1930, 262 pp., \$1.50.

UNIVERSITY AND COLLEGE ACCOUNTING. By
Lloyd Morey. New York: Wiley, 1930,
323 pp., \$6.

GUIDANCE (VOCATIONAL AND EDUCATIONAL)

HOW TO READ BOOKS. By Llewellyn Jones.
New York: Norton, 1930, 229 pp., \$2.50.

PRINCIPLES OF GUIDANCE. By Arthur J.
Jones. New York: McGraw, 1930, 385
pp., \$3.

WHICH COLLEGE? (rev. ed.). By Rita S.
Halle. New York: Macmillan, 1930, ix
+ 249 pp., \$2.50.

MENTAL HEALTH

ADOLESCENCE: STUDIES IN MENTAL HY-
GIENE. By Frankwood E. Williams.
New York: Farrar, 1930, 290 pp., \$2.50.

MANAGEMENT AND ADMINISTRATION

ALFRED WEBER'S THEORY OF THE LOCATION
OF INDUSTRIES (English ed. by Carl
Joachim Friedrich). By Alfred Weber.
Chicago: U. of Chicago, 1930, 289 pp., \$3.

CREDIT: THE MAGIC COIN OF COMMERCE.
By Maxwell Droke. Indiana: Business
Letter Inst., 1930, 205 pp., \$3.50.

OPERATING ASPECTS OF INDUSTRIAL MER-
GERS. By William R. Basset and John-
son Heywood. New York: Harper, 1930,
214 pp., \$3.

PROBLEMS IN INDUSTRIAL ACCOUNTING (2nd
ed.). By Thomas H. Sanders and Paul B.
Coffman. New York: McGraw, 1930, xi
+ 811 pp., \$6.

THE ART OF BUSINESS THINKING. By H.
G. Schnackel. New York: Wiley, 1930,
xix, + 147 pp., \$2.50.

THE TECHNIQUE OF EXECUTIVE CONTROL
(3rd ed.). By Erwin H. Schell. New
York: McGraw, 1930, 167 pp., \$2.

INDUSTRIAL EDUCATION

HISTORY AND ORGANIZATION OF EDUCATION
IN PENNSYLVANIA (2nd ed.). By Louise
G. Walsh and Matthew J. Walsh. Penn-
sylvania: State Teachers' Col., 1930, 428
pp., \$3.25.

VOCATIONAL INFORMATION

ATHLETICS OF TODAY: HISTORY, DEVELOP-
MENT AND TRAINING. By F. A. M. Web-
ster. New York: Warne, 1930, \$5.

BRICKWORK AND ITS CONSTRUCTION; A
TEXT-BOOK FOR ALL WORKERS IN
BRICK. By Walter R. Jaggard. New
York: Oxford, 1930, 330 pp., \$6.

BUSINESS LAW. By Earl S. Wolaver. New
York: McGraw, 1930, xii + 455 pp., \$4.

CLAYWORKER'S HANDBOOK (4th ed.). By
Alfred B. Searle. Philadelphia: Lippin-
cott, 1930, 383 pp., \$10.

ELECTRIC WIRING; A TEXTBOOK OF APPLIED
ELECTRICITY FOR VOCATIONAL AND TRADE
SCHOOLS (new 2nd ed.). By Albert A.
Schuhler. 380 pp., \$2.50.

ELEMENTS OF ELECTRICITY. By Anthony
Zeleny. New York: McGraw, 1930, 438
pp., \$3.

ENGINEERING OF ANTIQUITY AND TECHNICAL
PROGRESS IN ARTS AND CRAFTS. By
George Zimmer. Milwaukee: Caspar,
1930, 112 pp., \$3.

GEORGE EASTMAN. By Carl William Acker-
man. Boston: Houghton, 1930, xviii +
495 pp., \$5.

INTRODUCTION TO MODERN JOURNALISM.
By Stewart Robertson. New York:
Prentice-Hall, 1930, 389 pp., \$2.50.

MEN WHO FOUND OUT: STORIES OF GREAT
SCIENTIFIC DISCOVERERS. By Amabel
Williams-Ellis. New York: Coward,
1930, 259 pp., \$2.

PRACTICAL RADIO CONSTRUCTION AND RE-
PAIRING (2nd ed.). By James A. Moyer
and John F. Wostrel. New York:
McGraw, 1930, 353 pp., \$2.50.

PRINTING. By E. G. Porter. New York:
Pitman, 1930, 96 pp., \$1.

SPINNING, WEAVING AND FINISHING OF
FLAX AND JUTE. By Thomas Woodhouse

- and Peter Kilgour. New York: Pitman, 1930, 250 pp., \$3.
- THE COUNTRY NEWSPAPER AND ITS OPERATION. By James Saffley. New York: Appleton, 1930, vii + 383 pp., \$3.
- THE STUDENT'S HISTORY OF PRINTING. By Merritt W. Haynes. New York: McGraw, 1930, 107 pp., \$1.40.
- WOMEN IN GAINFUL OCCUPATIONS, 1870 to 1920. By Joseph A. Hill. Washington: G. P. O., 1930, 432 pp., \$1.50.

PSYCHOLOGY

- MIND AT THE CROSSWAYS. By C. Lloyd Morgan. New York: Holt, 1930, 286 pp., \$3.75.
- PILOTING YOUR LIFE: THE PSYCHOLOGIST AS HELMSMAN. By Joseph Jastrow. New York: Greenberg, 1930, 388 pp., \$3.50.
- PSYCHOLOGY AND RELIGION. By John Pitts. New York: Revell, 1930, 110 pp., \$1.25.
- PSYCHOLOGY FOR STUDENTS OF EDUCATION (rev. ed.). By A. I. Gates. New York: Macmillan, 1930, 627 pp., \$2.25.
- PSYCHOLOGY IN BUSINESS RELATIONS (2nd ed.). By A. J. Snow. New York: McGraw, 1930, 529 pp., \$5.
- REFLEX ACTION: A STUDY IN THE HISTORY OF PHYSIOLOGICAL PSYCHOLOGY: By Franklin Fearing. Baltimore: Williams & Wilkins, 1930, xiii + 350 pp., \$6.50.
- SEXUAL ABERRATIONS: THE PHENOMENA OF FETISHISM IN RELATION TO SEX, 2 vols., (trans. by S. Parker). By Wilhelm Stekel. New York: Liveright, 1930, 378 pp., \$10.
- THE AUTOBIOGRAPHY OF A CRIMINAL (ed. by Edmund Pearson). By Henry Tufts. New York: Duffield, 1930, xvii + 343 pp., \$3.
- THE NEW GENERATION, THE INTIMATE PROBLEMS OF MODERN PARENTS AND CHILDREN. By V. F. Calverton and Samuel D. Schmalhausen. New York: Macaulay, 1930, 717 pp., \$5.
- THE STRUCTURE AND MEANING OF PSYCHO-ANALYSIS, AS RELATED TO PERSONALITY AND BEHAVIOR. By William M. D. Healy and others. New York: Knopf, 1930, 523 pp., \$5.

ECONOMICS

- AMERICA LOOKS ABROAD: THE NEW ECONOMIC HORIZONS. By Paul M. Mazur. New York: Viking, 1930, x + 299 pp., \$3.
- AN INTRODUCTION TO THE MONEY AND BANKING SYSTEM OF THE UNITED STATES. By John P. Day. New York: Macmillan, 1930, viii + 120 pp., \$1.60.
- ELEMENTARY ECONOMICS; 2 vols. (rev. ed.). By Fred R. Fairchild and others. New York: Macmillan, 1930, 627 pp., \$2.50.
- INVESTMENTS TRUSTS—HOW AND WHY. By Israel B. Leibson. New York: Financial Pub. Co., 1930, 92 pp., \$2.
- OUR WANTS AND HOW THEY ARE SATISFIED. By Mollie R. Carroll. Boston: Barrows, 1930, 81 pp., \$1.
- OUTLINES OF ECONOMICS (5th rev. ed.). By Richard T. Ely and others. New York: Macmillan, 1930, 886 pp., \$3.
- SOVIET ECONOMIC DEVELOPMENT AND AMERICAN BUSINESS: RESULTS OF THE FIRST YEAR UNDER THE FIVE-YEAR PLAN, AND FURTHER PERSPECTIVES. By Saul G. Bron. New York: Liveright, 1930, 99 pp., \$1.50.
- STATISTICAL TABLES AND GRAPHS. By Bruce D. Mudgett. Boston: Houghton, 1930, 202 pp., \$1.75.
- STOCK SPECULATION AND BUSINESS. By George L. Hoxie. Boston: Stratford, 1930, 69 pp., \$1.
- THE ECONOMICS OF BRANCH BANKING. By Bernhard Ostrolenk. New York: Harper, 1930, 219 pp., \$3.50.
- WOMEN WORKERS AND THE INDUSTRIAL REVOLUTION, 1750-1850. By Ivy Pinchbeck. New York: Crofts, 1930, 352 pp., \$5.

SOCIOLOGY

- AMERICAN SEX PROBLEMS. By Dinshah P. F. Ghadiali. Malaga, N. J.: Spectro-Chrome Inst., 1930, 242 pp., \$3.
- LOVE IN THE MACHINE AGE: A PSYCHOLOGICAL STUDY OF THE TRANSITION FROM PATRIARCHAL SOCIETY. By Floyd Dell. New York: Farrar, 1930, 435 pp., \$3.50.

MRS. GRUNDY. By Leo Markun. New York: Appleton, 1930, 677 pp., \$5.

PROCEEDINGS OF THE NATIONAL CONFERENCE OF SOCIAL WORK (56th Annual Session). Chicago: U. of Chicago, 1930, 666 pp., \$3.

SOCIAL AND INDUSTRIAL CONDITIONS IN THE NORTH DURING THE CIVIL WAR. By Emerson D. Fite. New York: Peter Smith, 1930, 318 pp., \$3.75.

THE DANGERS OF OBEDIENCE, AND OTHER ESSAYS. By Harold J. Laski. New York: Harper, 1930, 293, pp., \$3.

THE FINANCIAL ORGANIZATION OF SOCIETY (3rd ed.). By Harold G. Moulton. Chicago: U. of Chicago, 1930, 790 pp., \$4.

WHAT THE WAGE-EARNING WOMAN CONTRIBUTES TO FAMILY SUPPORT. By Agnes L. Peterson. Washington: Women's Bureau, 1930, 24 pp., 5¢.

PHILOSOPHY

THE REVOLT AGAINST DUALISM: AN INQUIRY CONCERNING THE EXISTENCE OF IDEAS. By Arthur O. Lovejoy. New York: Norton, 1930, 337 pp., \$4.

Current Periodicals

PREPARED BY LINDA H. MORLEY, *Industrial Relations Counselors, Inc.*

COLLEGE MEN IN BUSINESS

MILLER, ARTHUR P. (Specialty Sales Manager, Aluminum Cooking Utensil Company). Placement and follow-up of college men. *Personnel*, May, 1930, Vol. 7, p. 9-12.

Presented at the Pittsburgh Personnel Association Dinner, April 1, 1929.

Company employs from 1500 to 2000 college salesmen each year as summer representatives. Work card is kept for each salesman, and any particular aptitude is noted. Prefer to make the contact first during sophomore or junior year. Training classes start in April.

ECONOMICS

GRAS, N. S. B. (Professor of Business History, Graduate School of Business Administration, Harvard University). Stages in economic history. *Journal of Economic and Business History*, May, 1930, Vol. 2, p. 395-418.

Economists have used economic stages as summaries of past development. Earliest ones of hunting, pastoral and agricultural pursuits go back to Dicaearchus of the 4th Century B. C. The economic stages are conditions rather than periods and occur at different times in different countries. They are not true or final, but are temporarily significant and important. Author discusses the use of "stages" by well known economists in historical sequence—Rosecher, Bücher, Schmaller and others in their work.

EMPLOYMENT STATISTICS

CROXTON, FRED C., (Department of Industrial Relations of Ohio), and CROXTON, FREDERICK E. Fluctuation of employment in Ohio, 1924 to 1928, and an estimate of unemployment of males.

Monthly Labor Review, April, 1930, Vol. 30, p. 745-780.

Statistical information concerning fluctuation of employment in establishments employing 3 or more persons, in agriculture, construction, fisheries, manufactures, mining and quarrying, service, wholesale and retail trade, and transportation and public utilities. Tables show fluctuation of employment of males and females in each industry. Department of Industrial Relations of Ohio has recently drawn up plans for stabilizing industry and employment by stimulation of public building, improvement of public employment offices, stabilization of employment in individual plants and industries, and study of extent and causes of unemployment.

FATIGUE

INTERNATIONAL LABOUR OFFICE. Fatigue tests. *Occupation and Health*, Brochure No. 187. 1930, 3 pp.

Fatigue tests comprise different methods of measuring industrial fatigue. They may be divided into (1) Direct Tests, which include physiological, chemical and psychological tests; (2) Indirect Tests, which include the industrial tests, output, spoilt work, lost time, quality of work, motive power, etc. Industrial tests are much more difficult to carry out, and harder to interpret.

INDUSTRIAL RELATIONS

BRUERE, HENRY (1st V. Pres., Bowery Savings Bank). Bank employees and the bank. *Personnel*, May, 1930, Vol. 7, p. 17-25.

Fundamental purpose of employing staffs and training them is to have business done efficiently. The N. Y. savings

banks serve more than 60 per cent of the population and the employees must have good manners, a respect for those in command, a knowledge of the business and dependability of judgment. With the help of the Personnel Department, and a Conference Committee of Employees, mutually beneficial activities are carried on in the Bowery Savings Bank.

CHAPPLE, BENNETT, (V. Pres., The American Rolling Mill Co.) Advertising department as a builder of employee morale. *Printers' Ink*, May 8, 1930, Vol. 151, p. 137-138.

"Ten services performed by the Armo advertising department not ordinarily viewed as advertising activities."

CIVIL SERVICE ASSEMBLY OF THE UNITED STATES AND CANADA. Summary of the proceedings of the twenty-second annual meeting. *Public Personnel Studies*, September-October, 1929, Vol. 7, entire issue.

Reports of the following sections and committees are included: Technical Section on the Organization of the Administrative Units of a Government; Technical Section on Coöperative Action with Civic Organizations; Technical Committee on Training Courses; Technical Committee on Classification and Compensation Plans; Technical Committee on Recruiting for Scientific Positions; Technical Committee on Layoffs and Reemployment.

GREENE, JAMES H., (Manager, Coöperative Department, The Studebaker Corporation). "Coöperative Department"—a new name for "Industrial Relations." *Printers' Ink*, April 10, 1930, Vol. 151, p. 146-153.

New name carries no implication of industrial paternalism. Scope of activities identical with that of industrial relations or personnel department. "Co-operative Plans" are published annually in a booklet including suggestions, service medals, etc., and general statements concerning policy of the organization. Aim of department is to provide a leadership which will enable employees to enjoy happy working conditions, which in turn will create efficient workers and a superior product.

JOHNSTON, G. A., and SPATES, T. G. Industrial relations in the London Traffic Combine: I, II. *International Labour Review*, April, May, 1930, Vol. 21, p. 494-518; 613-642.

"Traffic Combine" is used to denote transport companies controlled either directly or indirectly by the Underground Electric Railways Company of London, Ltd. Article deals with scope and character of the work of the Combine, and the organization and administration of industrial relations, covering wages, hours and general conditions of service, training, pensions, accident prevention, etc.

KENDALL, HENRY P., (Pres., Kendall Co.) Development of the art and science and philosophy of management since Taylor. *Society of Industrial Engineers Bulletin*, April, 1930, Vol. 12, p. 4-9.

In this opening address at the National Management Congress the President of the Taylor Society summarizes Taylor's principles and philosophy and reviews some of their applications which are to be found today in all well-run industries.

RORTY, MALCOLM C., (V. Pres., International Telephone and Telegraph Corporation, New York) Men—not things. *Bulletin of the Taylor Society*, April, 1930, Vol. 15, p. 99-106.

Science of management deals with methods; art of management deals primarily with men. Problem of humanizing industry is a growing one. Essential point to recognize that the corporation that secures unity of purpose in a loyal federation of leaders, working under a trusted chief, will always win in competition with organization that ranks the science of man above the art—that values things above men.

JOB ANALYSIS

HORWOOD, J. O., (Superintendent of Employment, Philadelphia Electric Company) Philosophy of labor. *Society of Industrial Engineers Bulletin*, April, 1930, Vol. 12, p. 10-30.

The principles and underlying philosophy employed in setting up occupational classifications for the Phila. Electric Co.

Classification and rating scales are given for some departments as illustrations of his practice as well as sample job specifications which illustrate the method of job analysis used.

LABOR LEGISLATION

WITTE, DR. EDWIN E. Injunctions in labour disputes in the United States. *International Labour Review*, Mar., 1930, Vol. 21, p. 315-347.

A study based on a detailed analysis of the more important labor cases in which injunctions have been issued. It examines many aspects of the question, and throws light on the complexities of what he considers one of the serious industrial problems in the U. S.

MENTAL HYGIENE

LAUGHEAD, MARY B. (M. S. S. (Smith) Psychiatric Social Worker, Clinic Assistant, Department of Employment and Placement, R. H. Macy and Company). Psychiatric social worker in mercantile life. *Annals of the American Academy of Political and Social Science*, May, 1930, Vol. 149, part 3, p. 160-166.

A number of "cases" are presented and results of department procedures outlined. The author thinks the psychiatric social worker has opportunity in a department store of analyzing the personality make-up and the potentialities of an individual for a given job and also for applying constructive treatment to individuals who may be misfits.

LOVEKIN, OSGOOD S., (Department of Industrial Research, Harvard Graduate School of Business Administration, Boston, Mass.) Quantitative measurement of human efficiency under factory conditions. *Journal of Industrial Hygiene*, March-April, 1930, Vol. 12, p. 99-119; 153-167.

Results of experimental study on blood pressures and pulse rates in a number of different laboratory and factory situations to establish standard and give correlations that could be applied under actual factory conditions.

OCCUPATIONS

ECKLER, A. ROSS. Occupational changes in the United States, 1850-1920, *Review of Economic Statistics*, May, 1930, Vol. 12, p. 77-89.

Six main groups are chosen for detailed study because the lines of demarcation in census figures are sufficiently clear to avoid error. These are: primary production (including farmers, miners, etc.), manufacturing, trade, transportation, professional service, and domestic and personal service. Charts show the relationships between groups from 1850 to 1920.

RETAIL CREDIT COMPANY. Synthetic amonia. *Industry Report*, April, 1930, Vol. 5, p. 39-47.

Occupational descriptions in nitrogen fixation processes. This series of reports is useful as a basis for job classification as well as to the safety man.

PROMOTIONS AND TRANSFERS

HAMMILL, RALPH M., (M.D., President, Illinois Society for Mental Hygiene), and Sharpe, Agnes A. Do men want responsibility? *Factory and Industrial Management*, Feb. 1930, Vol. 79, p. 304-306.

Industrial efficiency depends on utilization of man's desire to be recognized as an important and useful part of the working group. A scientifically planned procedure of promotions within an industry makes for coöperative effort on the part of the workers and management and keeps the employees developing their power of initiative.

SCIENTIFIC MANAGEMENT

CLARK, WALLACE (Consulting Management Engineer). American management methods in a European car shop. *American Machinist*, March 27, 1930, Vol. 72, 4 p. Reprint.

Gives example of a car shop, employing about 3,000 workmen. First step was to show each foreman how to plan his work one day in advance. Soon became apparent that better methods could be used. Value of the production for the year has

increased one million dollars over preceding year, and earnings of workers have increased. Does not give name of company.

SELECTION OF EMPLOYEES

EVERITT, GEORGE B. (Pres., Montgomery Ward). How Montgomery Ward builds retail store personnel. *Printers' Ink*, March 27, 1930, Vol. 150, p. 33-34, 36, 41-42.

Long apprenticeship idea gets a jolt when Ward assembles 10,000 retail store employees in two years.

UHRBROCK, RICHARD S. (Department of Hotel Administration, Cornell University). Where we look for good workers. *Nation's Business*, May, 1930, Vol. 18, p. 84-92.

Explains methods of hotel chain personnel department in filling the many specialized positions in hotels. Standard sources like colleges and schools, "help wanted" ads, labor scouts and employment bureaus, both public and private, are used along with bonus to old employees for recommending persons who stay six months or more; letters to placement bureaus of lodges, unions and other organizations. Cards of introduction to the personnel department are sent to stockholders, settlement houses and ministers and given to employees of lodging and boarding houses in neighborhood who have friends out of work. Both handicapped and cured patients discharged from hospital have been successfully placed through coöperation of hospital officers. Mentions one kitchen crew of deaf and dumb men which has broken record for length of service on job noted for high turnover.

TRAINING

ADAIR, R. G. (Supervisor, Safety and Training, The American Rolling Mill Co.) Foreman training that works. *Factory and Industrial Management*, May, 1930, Vol. 79, p. 1103, 1105, 1107, 1109.

Part I: Preventing waste of labor.

Poor planning, failure to transmit clear and complete directions, failure to improve the working technique of the

men, high labor turnover, and inability of supervisors to interpret cost sheets, all waste many dollars, by cutting down productivity. Armco is considering the establishment of a minimum standard which a man must meet, before he can be promoted to supervisory jobs.

COFFIN, VINCENT B. (Director of Education, The Penn Mutual Life Insurance Company). Measuring the results of training salesmen. *Personnel*, May, 1930, Vol. 7, p. 12-16.

Presented at Round Table Conference on Training Salesmen, held at Cincinnati, April 5, 1929.

Results are tangible, the dollar and cents results; and the intangible as important but not measurable. Experience has been in two fields, New York University (11 week course in insurance salesmanship) and the other in Penn Mutal Life Insurance Company. One result is lessening turnover of salesmen. Greatest single attribute of the course is the increased confidence in the salesmen.

FARRINGTON, F. B. (General Manager, Factory Service Division, The B. F. Goodrich Rubber Co.). Goodrich apprenticeship means an adequate training. *Trained Men*, Midwinter, 1930, Vol. 10, p. 7-10.

Mass production methods in the rubber industry have not eliminated the need for all-round mechanics. The B. F. Goodrich Company train their apprentices to be skilled mechanics, and have found that the program, including study-room period on company time, is more than paying its own way.

ROSS, DANIEL (Chief, Payroll Dept., John A. Roebling's Sons Co.). Foremen go to night school. *Iron Age*, April 10, 1930, Vol. 125, p. 1059-1060.

"Roebling Organization now engaged in fourth year of specialized educational effort which has resulted in many tangible evidences of value." Economies have effected, better human relations have been established, general policies of the company have been more accurately interpreted in the affairs of every day, greater pride manifested in production, evidences of increased loyalty abound,

and a noticeable reduction in waste has occurred." None of the education has been compulsory. Class this year three times the size of first year's group.

UNEMPLOYMENT

KNOEPFEL, C. E. (Cleveland). Worker and mechanized industry. *Society of Industrial Engineers Bulletin*, March 1930, Vol. 12, p. 7-18.

Discussion of Technological Unemployment, caused by machines and age limitations, which is considered the greatest single problem confronting the country industrially. Outlines of "Case material evidence of displacements," and "Quantitative evidences of displacement" are given. Constructive recommendations are to spread the gospel of high wages at low unit costs, through research and waste elimination; by bridging the gap between displacement and absorption, etc. We are not witnessing anything new, just dealing with logical "acceleration." Suggests that we accept the machine, but declare war on technological unemployment.

AMIDON, BEULAH. Civic front on unemployment. *Survey*, May 15, 1930, Vol. 64, p. 185-186.

First state committee (New York Committee on employment planning has submitted first report, with plans for dealing with problem on a community basis. Report outlines 3 methods of dealing with unemployment: Individual efforts of employers, coöperative efforts of citizens, and through governmental agencies. Material was obtained from 200 or more employers working out regularization schemes.

Results of the efforts of citizens in Buffalo, Rochester and Albany are cited. In Indianapolis, Dayton, St. Paul and Minneapolis, and in New England, communities have also organized to study methods for employment stabilization.

UNEMPLOYMENT RELIEF

AMIDON, BEULAH. Ivorydale. *Survey*, April 1, 1930, Vol. 64, p. 18-22, 56-57, 61, 64.

Procter and Gamble Company guaranteed employment plan; which provides

for 48 weeks of work during the year, a liberal scheme of sickness insurance and old age pensions, and opportunity to share in company's earnings through stock purchase.

Dismissal wage. *Monthly Labor Review*, April, 1930, Vol. 30, p. 715-719.

One of the earliest plans for the protection of the dismissed worker was introduced by the Delaware and Hudson Railroad in 1922 as part of group insurance plan. Methods now used by Dennison Manufacturing Co., Columbia Conserve Co., Consolidated Gas, Electric Light and Power Co., of New York, Firestone Tire and Rubber Company in taking care of their discharged employees are given. Agreement between Amalgamated Clothing Workers of America and employers provides for equal distribution of work among the regular cutters rather than their discharge. Mention is made of plan of the United States Rubber Company for taking care of employees when they lose their jobs, through merger or closing of the plant. Payment of dismissal wage in Germany, England, Japan, Mexico, and Greece is also discussed.

GIBSON, R. S. Incentive to work as affected by unemployment insurance and the poor law respectively. *Manchester School*, 1930, Vol. 1, p. 21-27.

Reasons are given why the Poor Law, rather than the Unemployment Insurance Bill, is responsible for reducing the will to work.

GILSON, MARY B. (Industrial Relations Counselors, Inc.) and Riches, E. J. (Research Division, International Labour Office). Employers' additional unemployment benefit schemes in Great Britain. *International Labour Review*, March, 1930, Vol. 21, p. 348-394.

Describes such private schemes as are now in force and compares their financial organization, methods of administration, provisions concerning eligibility, types and rates of benefit paid, length of benefit period, etc. The conclusion is reached that these plans are important chiefly as a means of making benefits more in proportion to wages than is possible under the flat rate system of the state scheme.

UNION MANAGEMENT COÖPERATION

Naunkeag experiment, a case of employer-worker coöperation in a New England Textile mill. Management point of view, J. FOSTER SMITH; Union point of view, JOHN P. O'CONNELL; Technician's point of view, FRANCIS GOODELL. *Bulletin of the Taylor Society*, April, 1930, Vol. 15, p. 63-77.

This experiment to bring about greater coöperation between employer and employee, worked out by a 90-year old tex-

tile mill, has met with great success. The present problem of rearrangement of work, and the making of new schedules of wages, was worked out by supervising executives, who had intimate knowledge of the jobs, with a trained technician and a committee representing management and the Union. Text of the Agreement made in 1919 between the Union and the Naunkeag Company is given. The discussion is from three viewpoints: Management, the Union, and the Technicians.

The Accident Clinic

How It Functions and What It Accomplishes

BY SADIE M. SHELLOW, *Milwaukee Electric Railway and Light Company*

The clinic,—the conference of specialists to diagnose an individual case of maladjustment and to decide on an appropriate course of treatment,—has its uses in industry as well as in medicine or in social work, as Mrs. Shellow admirably shows.

The Accident Clinic of the Milwaukee Electric Railway and Light Company aims to view the accident record of each high accident man from as many angles as possible. Its personnel includes representatives of the various departments concerned—the Claim, Medical, Welfare, Transportation, Safety, and Educational Departments. A thorough-going study is made of each operator who comes to the attention of the Clinic and a careful follow up is kept after the Clinic contact has been made. The results secured in a year's time with a group of the highest accident men from the various stations of the system are reported. A group of 33 high accident operators had, during an observational period of six months following the clinical examination, 81.5 per cent fewer accidents than during the six months prior to the examination. Lack of ability was judged to be the most frequent cause of accidents, while faulty attitude was next.

NINETY per cent of the causes for accidents are due to man failure."

This statement has been made so often of late that it is now quite generally accepted. Just what are these causes of man failure? This is the question which The Milwaukee Electric Railway & Light Company asked itself in studying the problem of the reduction of street car accidents.

ORGANIZATION OF ACCIDENT CLINIC

For several years the Psychological Division of the Educational Department has been making studies of individual motormen who have had rather heavy accident records.

In January, 1929, a regular accident clinic was organized. The purpose of such a clinic is to consider accidents and men who are having accidents from as many viewpoints as possible in order that the fundamental causes might be revealed, and remedial measures applied.

Each department which is in any way concerned with the results or causes of accidents is invited to send a representative. The chairman of the clinic is the assistant to the executive of the company. Around the table are gathered the Superintendent of Transportation, the Safety Director, the Medical Director, the head of the Claim Department, one or more Divi-

sion Superintendents depending upon which stations are concerned in the particular cases discussed, the Supervisor of Training, a representative from the Employees' Association, the Psychologist, and the Assistant Psychologist.

PROCEDURE

The Clinic meets every other Friday for the purpose of discussing special men whose cases are to be reviewed. Such men are selected by the Safety Director, because of recent piling up of accidents, or because of some

brief description of the accident, but the time when the accident occurred together with a decision as to whether or not the accident was chargeable or non-chargeable,¹ and an account of the cost to the company for such accident, as well as a statement of whatever discipline was applied.

In addition to this accident record an account is sent out by the Supervisor of Training to each member of the Clinic, which contains a summary of the man's record while in training and of the follow up reports during his service. A new follow up is made so

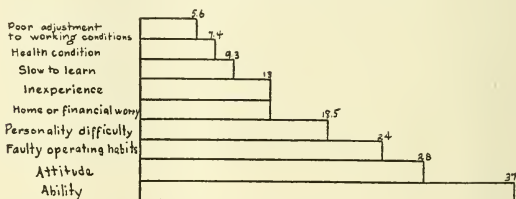


FIG. 1. CAUSATIVE FACTORS

specific accident which he feels points toward some deficiency on the part of the operator. The Division Superintendents may also suggest men for study, as may the Claim Department or the Superintendent of Transportation, or the Training Division. During the two-week interval from clinic to clinic, the record of the operator's entire service is reviewed, and a summary made. This summary indicates all the chargeable accidents which the operator has had since his entry into the service of the company. It will be noted that not only is there a

that the information will be at hand on the present operating habits of the operator. The Medical Director brings with him to the Clinic the medical record, and the representative from the Employees' Association brings a summary of whatever welfare

¹ A special study was previously made as to the relationship of so-called chargeable and non-chargeable accidents, chargeable accidents being defined as those for which the operator was in some measure responsible; that is, preventable accidents. It was found that out of 200 cases there was a correlation of only +.23. For this reason only chargeable accidents were described.

work or financial aid has been given to the man. The Psychologist brings a summary of an interview together with results of special tests² made within the two-weeks previous to the Clinic.

With all this information in hand each member of the clinic contributes whatever he knows about the operator

in question. The final summary is made by the Psychologist who interprets the material contributed by each of the others in the light of the personality of the operator together with his special abilities or disabilities and any special problems which may have become involved in the case.

On the basis of all this material recommendations are made. At six-month intervals the cases previously studied are reviewed in order to see what progress has been made. A sample report follows:

² Described in the JOURNAL OF PERSONNEL RESEARCH, 1925, vol. IV, no. 6, Selection of Motormen in Milwaukee, by Sadie Myers Shellow.

[FORM I]

DETAILED ACCIDENT REPORT

John Doe—\$ 797

In Service—12-18-19

Operator— 1-30-26

Collisions with persons.....	4	Pulling away from parking space...	1
Struck rear end of auto.....	3	Jerky stops or starts.	3
Collisions with cars.....	1	Autos making left turns.....	1

	<i>Date</i>	<i>Time</i>	<i>Location</i>
1. Truck loaded was at the curb and as car was about 20 feet back of it, pulled away and was struck	1-30-28	7:45 p.m.	11th Av. between S. Pierce-National
2. Car came to a stop with a jerk causing woman to fall	3-16-28	2:00 p.m.	Teutonia-Melvina
3. Blind case—car struck a man. Operator denies knowledge. Man boarded car following and reported it to operator	8-17-28	5:13 p.m.	47th-North
4. Blind case—woman tore her dress on seat and operator took her name and address. Was identified by woman as the operator of the car	8-28-28	2:50 p.m.	38th-North
5. Saw an auto stop a block away but could not stop his car until after he had struck it	12-16-28	1:32 p.m.	17th-North
6. Auto half a block ahead of car stopped. Operator was collecting fares and did not see it stop until too late	1-13-29	11:55 a.m.	North-16th
7. Woman boarded car and fell as car started because of jerk	3-31-29	5:25 p.m.	16th-North
8. Truck passed car, turned into track and made a left turn. Could not complete turn at once because of traffic coming against it, and was struck	5- 2-29	4:00 p.m.	North and Teutonia

9. Car was eastbound. A car northbound was standing at the south crosswalk discharging passengers. An auto passed this car and was struck by eastbound car 10- 8-29 5:45 a.m. 27th-Center

REPORT OF TRAINING DIVISION ON JOHN DOE—BADGE 797

Training

Operator Doe was turned in as a motorman December 18, 1919 and as an operator in 1926.

Follow-Up

This man has been followed regularly during the past year and a half. There have been two special accident follow ups during that time. The only faults that were shown consistently were taking more than one bite of air and stopping the car with a slight jerk because of not releasing enough air. Bad practices that were found at times were notching the controller more than one point at a time, running over intersections at a speed greater than the first running point, not always tapping the bell twice when starting his car, not using the standard expressions, and a lack of effort to do his work well. As a rule he has been given a good grading on the items of safety.

SPECIAL FOLLOW UP

Operation

Operator Doe crosses intersections at a speed greater than the first running point; he takes more than one bite of air; and stops his car with a jerk because of not releasing enough air.

Safety

This man has the ability to operate a car in a safe manner. He showed this by the manner in which he handled his car when a third instructor had ridden with him. However, there were a number of unsafe practices found by the first instructor and by another follow up when he did not know he was being watched. He appears to be careless and listless in his work. He does not always warn passengers when necessary; is sometimes careless when passing stationary cars; does not always sound his gong for parked autos; does not sound the gong loud enough; and does not always have his attention upon the street before him. This lack of attention is shown by filling his changer while operating the car; not always throwing off the power for circuit-breakers; looking back in the car while it is in motion; continually looking at things along the sidewalk; and in one case leaving part of his equipment at the other end of the car.

Service

He only calls the intersections when an instructor is with him, and he does not use all the standard expressions. Two of the instructors reported that this man is a bit quick tempered.

CONCLUSIONS

J. Doe has shown that he has the ability to safely operate a car. The bad practices found in his work do not seem to be regular habits, but rather are due to carelessness and lack of effort or energy on his part to do his work as it should be done. He seems to be in need of something that will wake him up rather than instruction on how to handle a car.

ACCIDENT STUDY REPORT

Name: John Doe *Badge:* 797 *Date:* 11-27-29
Address: *Age:* 37 *Length of Service:* 10 years
Civil Condition: Married *Dependents:* 2
Health: Good
Economic Condition: Good. Owns home.
Home Conditions: Apparently good.
Interests and Background: Interested mostly in home and radio. Occasional shows.
Attitude: Somewhat bored. Very difficult to get any information out of him. Does not like to talk unless questioned and then answers as abruptly as possible.
Personality: Not enthusiastic. Shut in. Quiet. Not very social. Hard to get at. Appears somewhat dissatisfied and unenthusiastic.
Test Results:
M. S. T. *Training:* 7 *Time:* 15' *Score:* 13
Judgment of Speed and Distance. *Score:* 5
Test Behavior: Appeared bored during test. Examiner did not feel he was doing his best. Effort was only mild. Grumbled to himself or became angered when he made errors. Fair coördination. Good control. On the whole has good ability.
Public Relations: Probably only fair as he does not take sufficient pains to be really courteous.
Analysis of Accidents:
Summary: Accidents are getting fewer. They were probably due to lack of real interest in the job or pride in his operation, since he has adequate ability.
Motorman's Account: He admits that occasionally his mind wanders off his job.
Causative Factors: For the most part personal, especially temperament.
Remarks: This man needs a little bucking up from the point of view of interest in his job, as well as checking up on careless practices. Would suggest rather frequent follow-up and friendly interest.

CONFERENCE ON ACCIDENTS

Subject: John Doe *Badge:* 797 *Date:* November 29, 1929

Accident Record: Fifteen chargeable accidents in less than three years. Four chargeable in 1929.
Training Record: Can operate his car in a first-class manner if he wants to.
Work Record: Entered the service December, 1919. Has been an operator since January 30, 1926. Known to be rather stubborn at the station.
Social Facts: Clear.
Test Behavior: Has good ability. Was bored during examination. Became angry at errors.
Personality: No enthusiasm. No motivating force. Introverted. Somewhat critical. Few interests. Lacks pride.
Causative Factors: Shut-in type of personality. Does not take pride in his job.
Conclusions: Instructor will try to stimulate pride in him.
Follow Up: 1-30-30. Collision with auto. This is the only chargeable accident he has had since November, 1929. 5-6-30. Has been followed up every week. Has shown steady improvement especially in regard to calling streets and handling controller. His attitude has greatly improved. He is taking a voluntary course in Electrical Equipment which is offered at the training building and is very much interested.

ANALYSIS OF CASES

During the year 1929 some 54 men were studied in the clinic. Of these 54, there were 33 followed up six months after their clinic contact. The total number of accidents six months before clinic contact were compared with the total number of accidents during the six months following clinic contact. This group of 33 men has been intensively studied in order to discover what effect, if any, the work of the clinic accomplished. The accompanying tables reveal many interesting facts.

From the table 1 it can be noted that there was a reduction of 81.5 per cent in the total number of accidents of the group of our highest accident men.

Table 2 shows the reasons for the men referred to the clinic.

Table 3 shows the distribution of the group according to four types. For purposes of control the distribution is also shown of an unselected group of 572 employees. In comparing the relative percentages of the various types of men in the unselected group, we find that proportionately there were fewer men who were conductors before becoming operators than there were motormen before becoming operators. In the accident study, however, the situation is reversed. The predominance of accidents among men who were conductors before becoming operators as compared with motormen before becoming operators is striking.

Seventy-six per cent of the group had been in service as trainmen two years or more. Only a few of the newer men were involved in this study. The purpose was to eliminate so far as possible inexperience as a factor in

TABLE 1

Clinic men who have operated cars six months after their investigation

BADGE NUMBER	CHARGEABLE ACCIDENTS 6 MONTHS BEFORE	CHARGEABLE ACCIDENTS 6 MONTHS AFTER
1093	3	1
1153	2	0
838	3	1
986	4	2
1316	1	0
1785	2	1
760	3	0
1016	2	0
1551	2	2
735	1	1
561	2	0
1831	1	0
496	2	0
1657	3	0
312	3	1
982	2	0
136	3	0
1477	1	0
1549	3	1
801	2	1
1012	2	1
1465	6	1
1865	3	0
1183	5	0
1812	4	0
1473	3	0
432	1	0
1241	2	3
1803	2	0
1620	4	0
2031	2	1
743	7	0
895	6	0
N = 33	92	17

Seven men are out of service

Five men transferred to conductors

TABLE 2

Reason for referring men to clinic

	CASES	PER CENT
Large number of accidents...	38	70
Type of accident or lack of improvement.....	16	30

accident causes, and to get at the older men who were piling up accidents.

It is interesting to note that the largest single causative factor was poor ability as revealed by the motorman selection test. These men either failed in the motorman selection test or were considered borderline cases. For the

whom he worked. Faulty operating habits were shown in the follow ups which were made previous to the clinic contact.

In many cases more than one recommendation was made. For example, a man may have needed a special interview for the purpose of stimulating his interest or changing his

TABLE 3
Type of men studied

	NUMBER OF CASES	PER CENT OF TOTAL CASES	PER CENT OF CONTROL GROUP
Group I. Conductors before becoming operators.....	23	42.5	27.1
Group II. Motormen before becoming operators.....	7	13	33.4
Group III. Motormen only.....	10	18.5	19.9
Group IV. Operators only.....	14	26	19.6
Total.....	54	100	100

TABLE 4
Length of service (in years)

	LENGTH OF SERVICE AS OPERATOR		LENGTH OF SERVICE BEFORE BECOMING OPERATOR		LENGTH OF SERVICE MOTORMEN ONLY	
	Med.	Range	Med.	Range	Med.	Range
Group I. Conductors before becoming operators.....	2	0.5-3	5	0.25-22		
Group II. Motormen before becoming operators.....	2.5	1-3.5	3	0.5-15		
Group III. Motormen only.....					9	2.5-28
Group IV. Operators only.....	0.75	0.25-3				

most part they were older men who were not selected with the aid of the tests, but who were given them later.

The next two largest factors are attitude and faulty operating habits. By attitude is meant that the operator did not take his accidents seriously enough or that he was not sufficiently interested in his job or that he felt antagonistic toward some person with

point of view, and also special training and follow up. The most frequent recommendation (see table 6) has been that of training and follow up. This was so generally the case that we now have a routine which is applied to all clinic men. As soon as a man's case has been brought up before the clinic for discussion his name goes on file in the training department and receives a

regular follow up once a week until he shows improvement. This follow up consists of having an instructor ride with him and instruct him on all points in which his habits are faulty. If there seems to be a serious difficulty, the man may be called in for special

observed, many old operators who had formed careless habits were re-educated and the newer men reminded of points which they had not actually absorbed and applied.

It will be interesting to note that out of the 54 cases studied only 3 were

TABLE 5

Causative factors

Each case averaged 1.5 causative factors

	NUMBER OF CASES	PER CENT OF MEN STUDIED (54)
Ability (80 per cent older* men, 55 per cent former conductors)...	20	37
Home or financial worry.....	7	13
Attitude.....	15	28
Personality difficulty.....	10	18.5
Inexperience.....	7	13
Faulty operating habits.....	13	24
Slow to learn.....	5	9.3
Health condition.....	4	7.4
Poor adjustment to working conditions.....	3	5.6

* Have been in service as trainmen two years or more.

TABLE 6

Recommendations

	NUMBER OF CASES	PER CENT OF MEN STUDIED
Training and follow up.....	30	56.0
Now considered safe.....	10	18.5
Referred to division superintendent or safety director for inter- view.....	4	7.4
Referred to superintendent of transportation for interview.....	3	5.6
Asked to leave service.....	3	5.6
Transferred to conductor.....	4	7.4
Examination by Medical Department.....	1	1.8

training on the practice track. This additional training is undoubtedly the real source of the phenomenal improvement in accident records. Aside from the induced added attention which the operator gave to avoiding accidents because of his consciousness of the fact that his record was being carefully

recommended for discharge. Effort has been made to reduce labor turnover by correcting the causes whenever possible. Even in those cases where there was poor ability, such training was designed which would tend to compensate to some extent for the inadequate ability, since the men were

old in the service and it was felt that their accident records were not such as to justify discharge.

Table 7 gives the reduction of accidents for the transportation department as a whole during the same period that the Accident Clinic operated.

TABLE 7

Chargeable accidents in entire transportation department January 1, 1929 to January 1, 1930

	TOTAL CHARGEABLE ACCIDENTS	TOTAL NUMBER OF TRAINMEN	ACCIDENTS PER EACH TRAINMAN
January 1 to June 30, 1929.....	883	1,154	0.8
July 1 to December 31, 1929.....	750	1,158	0.6*

* Reduction, 25 per cent.

The reduction over the system as a whole including the group studied in Accident Clinic was 25 per cent from January 1, 1929 to January 1, 1930. Over that same period the reduction in accidents on the special group studied in Accident Clinic was 81.5 per cent. And, in addition, the

average accident per clinic man was reduced from 2.8 to .51, which is below the average for the entire group of men.

SUMMARY

Aside from the actual reduction in chargeable accidents in the group of men who were studied six months before and six months after the clinic, other purposes have been accomplished. The clinic has served to introduce the personnel point of view to a group of executives each of whom has been concerned with transportation from a different angle. It has helped to co-ordinate many diverse attempts of safety work. This served to broaden the point of view of each member of the clinic by making him familiar with factors other than his own. And finally it has enabled the operators themselves to feel that they were getting a square deal and due consideration of their accident records. The clinic has become a permanent institution, and will continue to review the accident records of men who are piling up small accidents or having any unusual kind of accident.

Manuscript received May 8, 1930

Health and Labor Turnover in a Department Store

By C. J. Ho, formerly with R. H. Macy and Company, New York

It is no easy matter to disentangle the real from the fancied reasons for quitting a job. Ill health is sometimes alleged as an excuse; sometimes it is a real but overlooked complication.

Without debating the adequacy or reliability of data obtained in the leaving interview, Dr. Ho has taken them at face value and made comparisons which point directly toward the importance of attention to employees' health.

Since making this study Dr. Ho has joined the faculty of Cheeloo University, Tientsin, China.

The relation of health to labor turnover was studied on the basis of the experience of a department store for five years. It was found that on the average 7 per cent of all separations each year are caused by health reasons.

Different departments vary in proportion of health cases. In the selling departments studied an average of 11 per cent of all separations were for reason of health, while the non-selling departments range from 5 to 8 per cent. Among the selling departments, those having unfavorable location and physical conditions have greater proportions of health cases.

Health cases are more frequent in the spring than in the fall. On the average of the five years, there were 9 per cent in the first half of the year but only 6 per cent in the second half.

Women more frequently leave because of health conditions than men. One man was found in a hundred separations due to health, while 25 per cent of all separations were men and 75 per cent women.

The management is responsible for the health cases whether they are due to individual constitutions or environmental conditions. Practical measures such as health education, adjustments, selection, study of physical conditions and periodic physical examinations are suggested.

AMONG the factors pertaining to the individual which are responsible for the voluntary leaving of employees, health is generally recognized as the most important. It is true that in many organizations dissatisfaction with wages on the part of the employees usually causes a far greater number of separations than health, but wage is a factor pertaining to the job instead of the individual. Employment officers

who do exit interviewing are familiar with such reasons for resignation as "too tired;" "unable to stand the pressure;" "health is breaking down" and the like. Such complaints have two causes, the environmental conditions and the individual constitution. Although it is hard to determine which of the two is more important in most cases, they are both of great concern to the management. The former are matters of planning while the latter can be controlled by selection. So in the effort towards reduction of turnover, attention should be given to the health problem irrespective of the cause.

The present paper is a presentation of the experience of one mercantile establishment with turnover due to health. The data reported afford comparison with other similar organizations and the technique of analysis is suggestive to other investigators in this field. The report aims to answer a few of the principal questions regarding the relationship between health and turnover:

- (1) To what extent are health reasons responsible for turnover?
- (2) How do health reasons compare with other reasons?
- (3) Are there departmental differences in turnover due to health?
- (4) At what time of year do most health cases occur?
- (5) Are there sex differences in the frequency of health cases?

These, of course, are not exhaustive of the subject, but they are sufficient to point the direction for measures to reduce the number of health cases.

PROPORTION OF SEPARATIONS DUE TO HEALTH REASONS

In order to determine the extent to which health reasons are responsible for turnover, the records of the organization for five years (1924-1928) were examined. The number of separations reported as being due to health reasons each year was compared with the total number of separations in that year. The proportion of health cases to all separations in the five years are given in table 1. It will be seen that the proportion ranges from 6.8 per

TABLE 1
Separations due to health reasons in the entire organization

	NUMBER OF HEALTH CASES	TOTAL NUMBER SEPARATIONS	PER CENT
1924	564	7,767	7.26
1925	555	7,190	7.72
1926	811	10,008	8.10
1927	735	10,788	6.81
1928	804	11,522	6.96
Total...	3,469	47,275	7.33

cent to 8.1 per cent during the five years with an average of 7.3 per cent. There is a slight variation from one year to another, but it is too small to indicate any significant difference. It may be said then that health reasons are responsible for between 7 and 8 per cent of all separations in a retail organization like ours.

HEALTH REASONS COMPARED WITH OTHER REASONS

Although health reasons are not the most important of all reasons for separation, they occupy quite a significant

place. The comparison of causes for leaving is shown in table 2. Discounting the reduction of force which is involuntary on the part of both the employee and the management, the most frequently given reason for employees' leaving was "dissatisfied with wage." Home reasons such as the interference of domestic duties or change of residence are next in frequency. Those discharged because of unsatisfactory work constitute about the same proportion as those who left for health reasons, each amounting to about 7

TABLE 2
Causes for separations during 1924-1928

	PER CENT
Reduction of force.....	31.0
Dissatisfied with wage.....	16.0
Home reasons.....	12.0
Unsatisfactory work.....	7.5
Health reasons.....	7.3
All others.....	26.2
Total.....	100.0

per cent. In rank health reasons are the fifth of all causes, but the first of those pertaining to the individual.

DEPARTMENTAL VARIATIONS IN TURNOVER DUE TO HEALTH

Since it was not practical to study all the departments in the store, a few departments, selling and non-selling, were selected for study of variation. These departments were thought to be typical of various types of environmental conditions and personnel. The departments selected were the Controller's Office, the Delivery Department, the Merchandise Checkers (wrappers in the sales sections) and the Receiving Department for the non-

selling; and House Furnishings, Commercial Stationery, Silks, and Engraving for the selling.

In table 3, the sales departments as a group are compared with the selected non-selling departments. It will be noted that the sales departments have a far greater proportion of health cases than the average for the entire organization. The average of sales for the five years is about 11 per cent, while that of the entire organization is only 7 per cent. The difference will appear more significant when compared with those of the non-selling departments, all but one of which are below the average. The difference between the selling and the non-selling departments is to be explained by many factors. In the first place, the nature of work is different. Pressure of work, the standing position, and irritation by the customers are some of the causes for ill health in the selling departments which do not apply to the non-selling employees. Secondly, the physical conditions on the selling floors, such as ventilation, draft, lighting are generally less favorable than in the non-selling departments. Then, the personnel in sales is different from that in non-sales as we shall point out.

In the Controller's Office, the work is clerical in nature and the personnel is made up largely of girls under twenty-five years of age. The sales-clerks are mostly over 25 and a large proportion of them are married. In the Delivery Department, most of the employees are young men of good physique who work in the open air. The Merchandise Checkers are all young girls under eighteen and they are not so liable to physical disturb-

ances. The Receiving Department consists of several divisions which are not uniform in personnel and working conditions and there are probably variations according to division in the proportion of health cases.

Although the selling departments as a group show a greater proportion of health cases than the non-selling departments, an analysis of the selected

as actually poor working conditions. The employment of a large number of part-timer employees who are mostly married women over 30 years of age is perhaps another reason for the consistently large proportion of health cases in this department.

The small proportion of health cases in the Silks Department is to be explained chiefly by the fact that about

TABLE 3
Comparison of departments in separations due to health reasons

DEPARTMENT	PER CENT OF SEPARATIONS DUE TO HEALTH REASONS					
	1924	1925	1926	1927	1928	Average
Sales.....	10.97	12.79	11.49	9.70	10.51	10.88
Controller's.....	3.62	9.64	8.44	7.42	10.62	8.21
Delivery.....	1.47	1.10	1.98	1.72	1.53	1.59
Merchandise checkers.....	6.75	6.77	9.71	4.74	4.45	6.13
Receiving.....	3.39	7.22	4.35	6.39	4.42	5.04
Entire organization.....	7.26	7.72	8.10	6.81	6.96	7.33

TABLE 4
Comparison of selected sales departments in separations due to health reasons

DEPARTMENT	PER CENT OF SEPARATION DUE TO HEALTH REASONS					
	1924	1925	1926	1927	1928	Average
House furnishing.....	20.63	18.67	14.75	11.94	9.26	14.67
Stationery.....	5.56	9.09	4.00	7.14	11.43	7.69
Silks.....	8.33	0.00	8.51	2.70	9.09	6.25
Engraving.....	9.09	14.29	2.50	12.96	7.84	9.22
Sales total.....	10.97	12.79	11.49	9.70	10.51	10.88

selling departments disclosed great variations as will be seen in table 4. The House Furnishing Department is located in the basement floor and the location creates in the employees a mental attitude unfavorable towards their physical environment, even though the actual ventilation, lighting and other physical conditions may not be far from normal. Such an attitude causes ill health just as much

90 per cent of the employees in this department are men. Men leave less frequently than women for health reasons, as we shall see later. In the Stationery Department, the proportion of health cases is not very great. Nothing particularly unfavorable could be found in the physical environment of that department. The slightly high figure of the Engraving Department is probably due to the fact that it is

located against a wall without adequate ventilation and the presence of a constant draft.

Thus we have seen that the different departments vary greatly in turnover due to health conditions. In some cases it is the physical environment and in others it is the personnel that is the more important causal factor. No general conclusion can be reached, but in each case the cause has to be determined separately.

SEASONAL DIFFERENCES OF HEALTH CASES

In order to determine the relation of time of year to the occurrences of health cases, the two half years—January–June and July–December—were compared. The comparison for the five years is shown in table 5. It is inter-

TABLE 5
Comparison between two halves of the year in proportions of separations due to health reasons

	1ST HALF	2ND HALF	YEAR
1924	8.84	6.46	7.26
1925	8.74	7.19	7.72
1926	9.91	7.40	8.10
1927	9.84	5.37	6.81
1928	11.04	5.34	6.96
Total...	9.67	6.25	7.33

esting to note that in every year there was a greater proportion of health cases during the first half of the year. The explanation of this lies in the generally observed fact that more physical complaints develop in the spring season than in the fall. To confirm this observation, the records in the Medical Department were examined to see if more cases are treated in one

part of the year than in another. It was found that for three years, 60 per cent of the consultations occur in the first half of the year, and 40 per cent in the second half. The heaviest months are March and April.

SEX DIFFERENCE IN HEALTH CASES

Do men or women more frequently leave on account of health reasons? In order to answer this question the separations due to health reasons for the two sexes have to be compared with their total separations. Since it was not practical to study all the leaving employees, only the salesclerks were included. Of approximately 900 separations of salesclerks, 94 were due to health reasons. There were 25 per cent men and 75 per cent women in the 900 separations, but of the 94 health cases only one was a man. Perhaps it is the constitutional and physiological difference between the two sexes that makes one more susceptible to health difficulties than the other.

CONCLUSIONS AND SUGGESTIONS

Whether health cases are due to individual constitutions or environmental conditions, a responsibility lies with the management. If it is due to the former, the management is responsible for the selection and employment of such individuals; if the latter the management is responsible for the existence of unfavorable conditions. Therefore, measures for the reduction of health cases should be taken not only to reduce the cost of turnover but also to fulfill the moral obligations to the employee. The following may be suggested as practical measures for carrying this out.

Health education. Just as it is important to train employees how to perform their jobs, so it is to teach them how to keep themselves physically and mentally fit. A great number of employees are not familiar with the principles of physical and mental hygiene and therefore do not know how to prevent health difficulties. Health education, in the form of general principles, will enable the employees to take more intelligent measures in maintaining their good health, and consequently reduce the number of health cases. Therefore, it is suggested that the initial course of training of new employees include a lecture on hygiene and the significance of good health in success at work.

Adjustments. Regardless of the amount of preventive work in the way of education, a certain number of health cases are inevitable. When health cases do occur, efforts should be made, not only to diagnose and treat the patient, but to look into any possible responsibility on the part of the job environment in order that Management may be made aware of conditions needing improvement. In case undesirable environmental factors are discovered, either they should be improved

or the employee should be transferred to a different environment.

Selection. There is no doubt but that the Medical Department should include as part of its technique a more complete pre-employment examination which would stress the elimination of the "fatigue type," and thus help to reduce the number of potential health cases. People who show evidence of possibly becoming "fatigue types" should not be placed in an unfavorable environment.

Environmental Conditions. A survey of environmental conditions should be made of certain typical departments. Conditions such as inadequate lighting, poor ventilation, or continual drafts, should be improved as far as possible. In departments where this is not practicable, the employees should be compensated as far as possible by other factors, such as attractive wage, interesting work and pleasant human relations.

Periodic Re-examination. Finally, periodic physical examinations at regular intervals should be given to employees in order that health cases may be detected while they are incipient.

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Industrial Government in the Book and Job Printing Industry

BY J. F. BOGARDUS, *University of Pennsylvania*

The printing industry has traveled far along the road to industrial peace. Dr. Bogardus describes the origin and the present form of the government which this vast industry has evolved, not only for the avoidance or resolution of conflict, but also for the advancement of standards and the increase of good will and active coöperation.

IN NUMEROUS industries the relations between employers and employees have advanced to the point where a system of industrial government has been established; however, in but few cases have such relationships achieved a degree of permanence and success equal to that to be found in the book and job printing industry. The industrial government here found has been in operation over a long period of years and has functioned with a remarkable degree of success even during abnormal periods when many similar plans have failed. Accordingly a description of the background and the present system of law and order in this industry has an appeal to all who are interested in industrial relations.

THE BOOK AND JOB PRINTING INDUSTRY

To understand any system of industrial relations it is necessary to understand something of the industry within which it is to be found. A brief survey of the industry under consideration is thus a necessary preliminary to a discussion of the present system of government.

The printing industry is divided into two major fields, newspaper printing and publishing, and book and job printing and publishing. Both of these fields have had many experiences in industrial relations but attention will here be centered on those within the book and job field.

A book and job printing office may be defined as, "an office which does printing for the public or for an individual firm or company, or one that operates a printing plant for the production of its own or others' weekly, semi-weekly, tri-weekly or monthly publications, whatever the equipment of the foregoing may be, or whatever hours of the day they may be operated."¹ We thus find included plants publishing magazines, plants specializing in book or job work and plants combining all of these.

The industry is one of moderate size and consists largely of small units. Its size is indicated in table 1. Table 2,

¹Contract of Book and Job Offices between Printers' League Section, New York Employing Printers' Association, Inc. and Typographical Union No. 6.—October, 1924.

prepared from statistics also taken from the 1920 Census, illustrates the small size of the average unit. These small units permit a closer relationship to exist between employers and employees than is to be found in many industries.

Another characteristic which influences industrial relations is that printers are subject to less seasonal variation in employment than most other

born parentage. The skill of these workers has not been broken down by the introduction of labor saving machinery to the extent found in many trades. They have thus been able to maintain a strong bargaining position in their dealings with the employers.

A large degree of local autonomy exists within the industry. Each market has its own problems and meets them in its own way. The control exer-

TABLE 1

*Book and job printing industry in the United State—1919**

Number of establishments.....	13,089
Number of wage earners.....	123,005
Primary horsepower.....	131,961
Capital.....	\$405,554,984
Salaries and wages.....	\$207,196,883
Value of product.....	\$597,663,228
Value added by manufactures.....	\$386,596,054

* U. S. Census, 1920, "Fourteenth Census—Manufactures," Vol. 10, p. 567, Table 2.

TABLE 2

*Size of establishments in the book and job printing industry in the United States by the number of wage earners—1919**

TOTAL ESTABLISH- MENTS	WAGE EARNERS	NUMBER OF ESTABLISHMENTS EMPLOYING							
		Not on wage scale	1 to 5	6 to 20	21 to 50	51 to 100	101 to 500	501 to 1000	Over 1000
13,089	123,005	3,226	6,479	2,479	822	236	154	9	2

* U. S. Census, 1920, "Fourteenth Census, Manufactures," Vol. 10, p. 571, Table 7.

groups of skilled workers. The problem of irregularity of employment is thus not so aggravating as in many industries.

The industry is also made up of a high type of skilled workmen. The traditions and high standards of craftsmanship maintained have tended to attract to the printing trades a superior type of workman. These workers are mostly English-speaking and of native-

cised by the national and international bodies of employers and workers is not great. Thus industrial relations have developed differently in the various markets in response to local conditions. Accordingly a survey of the national industry would show no uniformity of conditions or of industrial practice. Attention will therefore be centered on New York City because it is the largest producing area in the

country and because the industrial relations and industrial government there found are the most interesting.

New York City is of special interest in any study of the book and job printing industry because it is the largest producing area in the United States, representing as it does from twenty to twenty-five per cent of the Nation's production. This percentage varies from year to year, the figure given by the Fourteenth Census for the year 1919 being 21.6 per cent. This amount is made up of the production of some 2,000 plants varying in size from the small "bedroom shops" to a few units employing nearly 1,000 workers. Competition between these plants is keen and there is also a considerable amount of competition with other centers for certain types of work. New York is thus the largest printing center in the country and is an area in which all types of establishments are represented.

Within the New York area both employers and employees are well organized. The employers organization is known as the New York Employing Printers Association, Incorporated. It was formed in 1919 as the result of the amalgamation of a group of smaller employers' organizations. Both union and non-union employers are represented. The closed shop or union employing printers are combined into what is known as the Printers League Section of the New York Employing Printers Association, Incorporated. This union employing group organized the Printers League of America following the strikes of 1906 and 1907. The local branch of this organization continued to function independently until

1916 when it was combined with the local branch of the United Typothetae under the name of the Association of Employing Printers of New York; the League, however, maintained its autonomy within this body. As a result of the amalgamation in 1919 the League again maintained its autonomy within the larger organization and today the Printers League Section of the New York Employing Printers Association, Incorporated, is always referred to simply as the Printers League.

The League has a membership of some 175 firms. As these 175 are for the most part large, it is estimated that it controls from 80 per cent to 85 per cent of the book and job production of New York City. It is this group of employers together with the unions with which they deal who are responsible for the development of industrial government in the area.

The employee organizations with which the Printers League deals comprise the locals of the International Typographical Union, the International Printing Pressmen's and Assistants' Union and the International Brotherhood of Bookbinders. The International Typographical Union is represented by Typographical Union No. 6, usually known as "Big Six," and Mailers' Union No. 6. Representing the International Printing Pressmen's and Assistants' Union are Printing Pressmen's Union No. 51, New York Press Assistants Union No. 23, and New York Paper Handlers' and Sheet Straighteners' Union No. 1. The International Brotherhood of Bookbinders also has three locals, namely, Printed Bookbinders' Union No. 25, Paper Cutters' Union No. 119, and

Bindery Women's Union No. 43. League. The size and relationship of these locals and the international unions is indicated clearly in figure 1. All

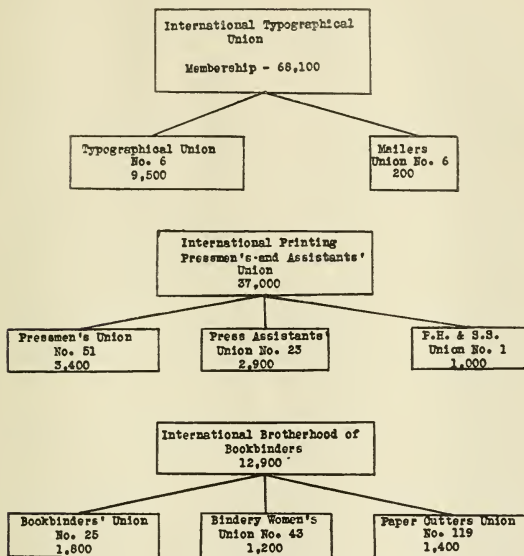


FIG. 1. SIZE AND RELATIONSHIP OF THE INTERNATIONAL UNIONS AND THEIR NEW YORK LOCALS WHICH DEAL WITH THE PRINTERS' LEAGUE

The membership of the International Unions is for the year 1923 and was taken from: Leo Wolman, *The Growth of American Trade Unions, 1880-1923*, p. 116. The membership figures for the Local Unions were for the year 1925 and were obtained from the local union officers.

These unions vary in the degree of organization and in strength but the combined bargaining power of the group is currently supposed to be approximately equal to that of the Printers League and all have played a part in the development of industrial government

within the city. Figure 1 charts the size and relationship of unions which deal with the Printers League.

COLLECTIVE DEALINGS

The early organization of the printers' unions led to a correspondingly early development of collective bargaining. Even prior to 1800 groups of employees drew up wage scales which they presented to individual employers and went out on strikes if these scales were not accepted. However, these early organizations were short lived, disbanding as soon as the particular purpose for which they had been assembled was accomplished.

With the establishment of relatively more stable unions during the first decade of the 19th century, dealings with the employers became more frequent. Wage scales were drawn up and presented, apprenticeship regulated, and hours and working conditions discussed. These negotiations were carried on with individual employers but efforts were made to maintain uniform wage scales and working conditions throughout the area. This type of relationship between the union and the individual employer continued until about 1864.

The year 1862 was marked by the formation of the New York Typothetae, an organization of employers which first turned its attention to purely financial affairs but which was soon forced to deal with the unions concerning wages. After 1864 collective dealings were carried on between the unions and the Typothetae and the unions and individual employers. This arrangement continued until 1906 when the strikes for the 48

hour week caused the Typothetae to sever relations with the unions. This severance led to the formation of the Printers League and since that time collective dealings have been carried on between the various unions and the League.

Agreements between the unions and the League dealt with every phase of industrial relations such as wages, hours, working conditions, and apprenticeship. They have been drawn up to cover periods ranging from one to three years. For example agreements were concluded between the Printers League and Typographical Union No. 6 in 1907, 1910, 1913, 1916, 1917, 1918, 1919, 1922, 1923, 1924 and 1927. Within recent years an effort has been made to adjust the contracts with all the unions so that they will expire on approximately the same date; for instance all contracts expired on either September first or September thirtieth 1927.

In order to take care of any disputes which might arise in the formation or the interpretation of the contracts arbitration agreements were drawn up between the unions and the League. The first agreement of this kind was concluded with Typographical Union No. 6, on March 3, 1908. Since that time similar agreements have been concluded with all the other local unions. Within recent years Typographical Union No. 6 has refused to renew its arbitration agreement and Mailers' Unions No. 6 has followed its example. However, at present such agreements exist with all the other unions and even these two continue to arbitrate in spite of the lack of contracts. Records are avail-

able of some 38 disputes having been arbitrated under these agreements between 1908 and 1925. Almost without exception these disputes have been concerned with the fixing of wage rates in the formation of contracts. The unions and the League have been able to reach an agreement on all other matters in the formation of contracts and in most matters pertaining to disputes arising under the contracts without the necessity of outside assistance. Between 1907 and 1929 only two instances of direct action occurred. These took place in 1917 and 1919 and were the results of internal dissensions within the unions themselves and of the abnormal conditions existing during and immediately after the World War. Both were short lived and relatively unimportant.

Collective bargaining and arbitration have thus been successful in maintaining industrial peace and in promoting the well-being of the industry. They have also resulted in the gradual building up of a system of industrial government which is functioning successfully at the present time.

PRESENT SYSTEM OF INDUSTRIAL GOVERNMENT

The system of industrial government now in use had its beginnings soon after the formation of the Printers League and has changed but slightly from that time until the present. While it is not perfect it has functioned with a sufficient degree of success to satisfy both the unions and the employers. It has preserved industrial peace, with but two exceptions, over a period of twenty years. It has promoted a spirit of mutual cooperation and confidence and has so interwoven itself into

the life of the industry that all parties accept it without question and without thought of serious change.

The first phase of such government to consider is that concerned with the formation of the contract. This may be regarded as the legislative branch of the government for it is concerned with the creation of industrial law. These contracts or agreements are concluded between the Printers League, representing the union employing printers, and the various local unions. They cover all the various items of industrial relations such as wages, hours, apprenticeship, and working conditions and fix the conditions relative to these points under which the parties are to work for the period of the contract.

The method of concluding these agreements is uniform with all the unions. A joint committee is set up on which the union and the League has equal representation. These committees are usually composed of the most capable men on each side. The committee takes up each phase of the contract in turn and considers the demands and counter-demands put forward. Agreement is frequently reached on all points. Occasionally, however, one or two points cannot be decided and are referred to arbitration. With but three exceptions during the history of the League these points have had to do solely with wage scales. It is interesting to note that all parties concerned contend that shop rules and working conditions must and can be settled in the committee without reference to an outsider while they regard arbitration as well fitted to deal with wage rates. If it is necessary to take a point to arbitration that point is def-

initely set forth in a statement of fact and the arbitrators are cautioned to deal only with these facts. Both sides seem to fear that some arbitrator may step outside the set bounds and deal with points other than those specified.

After the parties have agreed to submit a certain point or points to arbitration they turn to the committee for the selection of the arbitrators. Some unions prefer a board of three arbitrators while others prefer only one. The arbitrator is chosen by each side presenting panels of names until one is finally selected. The length of time required and the ease or difficulty of selecting arbitrators always depends upon the importance of the issue to be settled. However, sooner or later such arbitrators are agreed upon.

The arbitrators being selected, the date for the first hearing is set. At this hearing elaborate and carefully prepared briefs are presented, after which it is adjourned and a considerable time, often several weeks, is allowed for the preparation of rebuttals which are in writing and deal with all the points taken up in the brief. After the rebuttals have been presented each side is allowed an oral sur-rebuttal which closes the argument. A few days are then allowed the arbitrator to prepare his decision which is usually brief covering only the award and the reasons for it. The presentation of the award concludes the proceedings and the parties themselves take care of the enforcement of its provisions.

Although elaborate provisions exist for the enforcement of the award they are seldom if ever needed. Both parties accept the decision of the arbitrator or arbitrators without question.

Thus, whether by direct negotiations in the committee or by arbitration, the terms of the contract are settled and the laws which are to guide industrial relations are fixed for another period.

After the terms of the contract have been settled another phase of industrial government becomes important. This is concerned with the interpretation of the contract and the settlement of any disputes that may arise under it. This might well be called the judicial function of the government.

Perhaps the best way of visualizing the machinery and the procedure for the settlement of such disputes is by means of a diagram which will illustrate the various stages through which such a case must pass. Figure 2 presents such a diagram.

A dispute arising under the contract may involve one man or several men within the shop but in either case it first involves the men directly concerned and the foreman, who has charge of personnel relations within the plant. If no settlement can be reached at this stage the men may carry their complaint to their union chapel chairman. The chapel chairman is the local representative of the union in the shop. It is customary for each craft to have a chapel organized in each plant and to elect chapel officers to look out for their interests. If the shop is very small, all the union men in it may appoint one of their number to perform the same function. Many disputes are settled in the shop either by negotiations between the men involved and the foreman or between the chapel chairman and the foreman.

If the dispute cannot be settled in the shop it is supposed to be carried to

the President of the Printers League and the President of the local union involved. As a matter of actual practice it goes to the Secretary of the Printers League and to the President, Secretary, or some other official of the union. These men then confer and it is estimated that 99 per cent of the disputes coming out of the shop are

mittee is chosen by the League to deal with each union. It has been customary for the League and the unions to appoint their committee representatives from among their most capable members and such representatives normally hold office during the life of a contract. The committees may meet separately or jointly

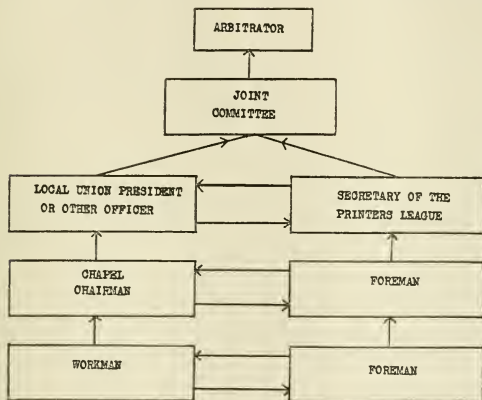


FIG. 2. STEPS IN THE SETTLEMENT OF A DISPUTE ARISING UNDER A CONTRACT

settled at this point. If an agreement cannot be reached the controversy is turned over to the Joint Conference Committee.

These committees, which form an important part of the machinery of industrial government, consist of five members and five alternates from each side. Every union has its own committee and usually a different com-

mittee is chosen by the League to deal with disputes arising under the contract. Such a committee must act within five full business days after a case has been referred to it and must reach a decision within ten full business days after receiving the controversy. A majority vote of each part of the committee is necessary to a decision. If such a decision can-

not be reached within ten days or if it proves unsatisfactory to either side an appeal is allowed to an arbitrator. In actual practice, however, the decisions of the committees are usually accepted as final. Very few appeals are made from their findings.

It is difficult to estimate the number of cases handled by such committees each year for that must depend upon the number and type of disputes which arise, which in turn depend upon existing economic conditions, leadership and other factors. However, under normal conditions perhaps six or seven cases a year might be taken as an average for each union.

Special joint committees exist for handling questions of discharge and apprenticeship. Those committees having control over questions of discharge consist of three members from each side and their decision is final. If no decision can be reached, the committee then selects a seventh member and the decision of the committee thus constituted is final. If it is unable to agree upon a seventh member he is selected by the Presiding Judge of the Appellate Division of the New York Supreme Court of the First or Second District. The apprenticeship committee consists of five representatives from each side and its decisions are final on all matters concerning apprenticeship.

If either party desires to make an appeal from the findings of the Joint Committee that party must notify the other within five days after the decision has been reached and must file a written statement setting forth the grounds for the appeal. The Joint Committee then selects an arbitrator

by a majority vote of each part. If it cannot agree upon an arbitrator, each side selects one and the two so selected choose a third. The decision rendered by such an arbitrator or board of three arbitrators is final. The method of procedure before the arbitrator is the same as in cases involving the formation of a contract.

The division of industrial government concerned with the settlement of disputes arising under or from the interpretation of a contract has now been considered in all its stages. Of necessity it has to handle many disputes but most of these are settled by the parties directly concerned or by the Secretary of the League and President of the Union. Few get as far as the Joint Committee and not more than three have been taken as far as arbitration during the entire life of the League. As time goes on the number of disputes coming before the Joint Committee becomes less, for the Shop Rules and Wage Scales Contract between the League and the unions differ but slightly from time to time. Consequently almost all their provisions have been interpreted and are well understood by both parties. Thus the necessity for interpretation either by the Joint Committee or by an arbitrator is slight. The future will probably see an increasingly large proportion of the cases settled in the shop or by the heads of the two organizations concerned.

The executive function of the industrial government rests in the officers of the local unions and of the Printers League. These men enforce the industrial law as set forth in the contract and carry out the decisions rendered by the

Joint Committee or the arbitrator. The mutual confidence which exists between these groups of officers makes it easier for them to coöperate in carrying out the executive function.

The only important criticism made of the machinery or procedure of industrial government by either employers or union officials was directed against the method of selecting an arbitrator where arbitration was necessary. This criticism was widespread but no new methods of selection were advanced and it seems likely that the present system will not be changed in the near future.

RESULTS OF THE USE OF INDUSTRIAL GOVERNMENT

It is always difficult if not impossible to determine accurately the results of any one feature of industrial relations because so many factors may operate to bring about the resulting conditions. The results which are attributed to the industrial government in the printing industry must therefore be arrived at not by scientific analysis but rather by the consensus of opinion of those engaged in the industry. The majority of those representing labor and employers attribute three results to the existing system of government; namely, freedom from strikes, lockouts, or other forms of industrial warfare; an improved spirit and increased co-operation; and a tendency towards higher wages especially among the weaker unions. It is not at all impossible that other results may have been brought about or that other factors besides the present system of industrial government may have aided in bring-

ing about those named. However, these are the results that those with the most intimate knowledge of the industry attribute to the form of industrial government which has been in use since 1907.

The existing system of government has been in use some twenty-two years. During that period only two disturbances have occurred to disrupt the industrial peace and these came in the period of abnormal conditions during and immediately following the World War. Both were of minor importance. Two breaches of the peace in twenty-two years, each involving only one international union and lasting but a short time, seem but a small number in an industry of the size and complexity of the Book and Job Printing Industry of New York City. However, before this can be taken as an indication of the success of the present system of industrial government some comparison must be made of the number of breaks before and after 1907. As accurate data were lacking for the period preceding the formation of the Printers League, an effort was made to get the opinion on this point of employers who have been active in the New York area for a number of years. The opinions of ten such employers were secured and nine out of the ten reported that there had been a decrease in the number of disturbances since the present system of government was introduced. From these replies it may be assumed that the form of industrial government now in use has been successful in materially reducing the number of strikes and other labor disturbances. When it is remembered that the period covered contains the abnor-

mal years of the World War the result becomes all the more noteworthy.

The second result claimed is that the existing system of industrial government has brought about a better feeling and closer coöperation between employers and unions. Here again other factors may have exerted an influence and it becomes almost impossible to determine just what portion of the result can be attributed to this cause.

Unquestionably there has been a much better spirit and much closer coöperation between the unions and the employers since 1907 than before, although, as some employers point out, this coöperation might be extended. The old spirit of bitterness and hostility engendered by frequent strikes is passing. Although traces still remain, it plays a less important part than formerly. The two parties have demonstrated their willingness and ability to coöperate. This is shown especially by efforts to raise the standards of the industry within the city. Very efficient schools for the training of apprentices have been established, being jointly managed and financed by the League and the Pressmen's and Compositors' Unions. Much stress is placed on this coöperation by the Secretary of the Printers' League and the union officials. It seems very likely that the existing form of industrial government has aided materially in bringing about these results.

Many employers attribute the higher wage scales and the severe shop rules and regulations existing within New York City to the industrial government now in use. A study of the prevailing conditions indicates that wage scales and shop rules are the results of cer-

tain local conditions, such as costs of living and degree of organization, and that the existing form of government has exercised but slight influence over them. It does seem, however, that the present form of industrial government may have resulted in higher wage scales for the weaker unions. This is indicated by the fact that wage scales among such unions rose rapidly after the present government was introduced while the wages among the stronger unions advanced at a slower rate.

The three results discussed, namely, the reduction in the number of labor disturbances, the improved spirit and coöperation within the industry, and the tendency to increase the wage scales of the weaker unions, are probably not the only ones which can be attributed to the present industrial government but within the industry they are regarded as the most important.

The attitudes of the various elements of the industry towards the present industrial government may be regarded as an additional test of its effectiveness. The attitude of the officials of the Printers' League is favorable to the present form for they feel that it has aided materially in reducing the number of labor disturbances and in fostering better relations between the unions and the employers. The majority of individual employers speak highly of the work of the government now in use but occasionally point out certain features which they regard as undesirable. Union officials were less ready in their praise than were the employers. Their chief criticism was against certain features in the present

use of arbitration. In general the weaker unions have a more favorable attitude than the stronger ones. Although individual opinions concerning the importance of the results achieved differ yet there cannot be found today within any division of the industry a sentiment for the abandonment of this agency, therefore its contributions must be regarded as sufficiently important to justify its continued existence.

SUMMARY OF FACTORS INFLUENCING INDUSTRIAL GOVERNMENT

In discussing the characteristics of the Book and Job Printing Industry and the background and machinery of present collective dealings, certain factors were touched upon which have exerted a profound influence upon industrial government. While it is impossible to evaluate accurately the importance of these, yet it seems desirable to point them out and, where possible, to indicate something of their contributions towards the success of the present system of industrial relations.

The first important factor is the type of the industry itself, being made up largely of small units. This has permitted a closer and a personal relationship to exist between employers and employees and seems to have resulted in a better understanding of each other's problems by the two parties concerned.

The high degree of local autonomy existing within the industry has also exerted some influence in that it has tended to create more competent local officials, especially within the unions. Such officials must decide and handle

their own problems and consequently men of real ability are usually selected. Such men more readily appreciate the value of industrial government and strive to make it a success.

The regularity of employment within the industry is another favorable factor. In many industries seasonality of employment gives rise to a group of problems which lead to constant friction. The absence of these problems in the industry under consideration has aided in smoothing the way for industrial government.

The type of workmen and employers to be found in the printing industry is another favorable factor. The workmen are mostly of a high type and American born. This tends to make them more able to understand and appreciate the desirability of an advanced form of industrial relations. The employers are mostly broad minded, capable men. Many have risen from the ranks and thoroughly understand the worker's point of view. These men have exerted a continued and powerful influence towards improved conditions and better relations within the industry.

The type of leadership to be found within the unions and the Printers' League is another factor which has exerted a profound influence. The leadership of the Printers' League has been of unusually high quality. This high type of leadership has influenced the printing industry since the early days of the past century and has been responsible for devising a mechanism for the handling of industrial relations which has its roots deep in the industry. The present structure is the result of the industry's own efforts expressed by

its leaders, both on the side of employers and the unions.

The long experience with collective dealings, covering a period of over a century, is another element which has aided in bringing employers and employees closer together. As the result of this experience the two sides have become accustomed to solving their problems jointly and have learned to meet and talk over their differences without bitterness.

The existing economic conditions also exert an influence. During periods of economic stability the number of disputes tends to decrease, a more broad-minded attitude prevails and the two sides are much more ready to look with favor upon some form of industrial government. A period of economic change or uncertainty, such as existed during and immediately following the World War, places many difficulties in the path of peaceful relations and is likely to cause a resort to direct action.

An additional factor which many regard as of considerable importance is the equality of bargaining power of the two sides. This equality indicates that either side would be reluctant to resort to direct action as the outcome would be uncertain. Consequently

the parties prefer to work together rather than resort to the use of force.

The attitude of the international unions has also played a part in the success of industrial government. For the most part they have favored co-operation and peaceful relations and the local unions have reflected their attitudes.

The machinery of industrial government has also played some part in the success of this agency. While the will to coöperate peacefully must ever be more important than the machinery used, such machinery, by providing a way to make that will effective, aids in the success of industrial government. Although not perfect this machinery has functioned over twenty-two years with a considerable degree of success and has the backing of all the elements represented in the industry.

These factors acting with varying degrees of effectiveness have built up within the industry a spirit and a habit of collective dealing which has made the present industrial government possible. They have been responsible for the results which such government has achieved. The future of industrial government in the Book and Job Printing Industry will depend largely upon their future operation.

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A Scoring Technique

For Tests Having Multiple Item-Weightings

BY PHILLIP JUSTIN RULON AND WESLEY ARDEN, *University of Minnesota*

Measures of interest or vocational attitude, such as Strong's test yields, require the proper weighting of so many responses that the necessary clerical work taxes the patience,—or the budget. Even so, these indications of a person's bent are worth the cost. Their practical use will become more general as the labor of scoring is lessened. The invention here described is such a labor saving device.

This article reports the development and use of a technique for scoring the Strong Vocational Interest Blank. The technique is applicable to the scoring of any tests, but is most economical when employed on tests in which various items are weighted differently, where the system of weighting changes with successive scorings of the same blank. The Hollerith Tabulating and Accounting Machines are employed. A card is punched for each possible response to the test instead of for each subject who takes the test. Each card carries a series of ten weights. From these cards, the ones corresponding to the responses an individual has made are selected, and put through the tabulating machine. Several scores are thus obtained simultaneously. Compared with the usual clerical process, a saving of approximately 80 per cent was effected by this technique in obtaining twenty scores from each of one hundred Strong Blanks.

FOR facility in scoring, most tests are so arranged that all items in a given section affect the subject's final score to the same extent, and the number of items "right" may be combined with the number "wrong" in some fashion to give the total score.

Certain tests, however, are so arranged that various items scattered throughout the blank are weighted in different ways,—that is, certain items are more important than others, and are counted more heavily in the scoring of the blank. A further complication

may be involved in scoring such a blank if the items are of the multiple-response type, each possible response being differently weighted, so that, for example, a three-choice item will affect the subject's score in one of three ways, depending upon which response is chosen.

The upper limit of complexity in scoring seems to be reached when each possible response is assigned a certain weight, and scoring is accomplished by summing the weights attached to those responses chosen by the subject. The scoring of such tests by ordinary cleri-

cal methods is somewhat expensive, and their widespread use is hindered. Especially is this true if each subject's blank is to be scored a number of times, each time with a different set of weights to be assigned to the various responses.

Such a test is exemplified by the Strong Vocational Interest Blank,¹ which may be scored a large number of times for each subject, giving at each scoring a numerical expression indicative of the degree to which the subject's responses agree with those of a criterion group of successful men in a given profession. Keys have been published for 18 professions, and provisional keys are available for still others, so that a single blank may be scored 18 or more ways.

The administration of such a test to any large number of subjects requires either that an enormous budget be set up for the clerical labor of scoring, or that a technique be evolved for scoring the test by other than the usual clerical methods. A technique recently developed and employed in scoring a number of Strong Blanks at the University of Minnesota effected rather surprising economies in time and expense, and enabled the obtaining of data which would otherwise have been beyond the limitations of the budget.

The method involves the use of Hollerith tabulating and analysis machines. It is applicable to the scoring of any test. Pronounced economy of time and expense is attainable only when the operation requires handling the same blank a number of times, each time with a different key. Probably the best possible exposition of the tech-

nique is a description of the set-up and procedure recently employed on the Strong Blank.

This blank contains 420 three-choice items like the following:

Actor.....	L	I	D
Advertiser.....	L	I	D
Architect.....	L	I	D
Army Officer.....	L	I	D
Artist.....	L	I	D

The subject is required to encircle opposite each item the L, I, or D, indicating Like, Indifference, or Dislike to engaging in the occupation mentioned in the item. Other sections of the test deal with sports, amusements, activities, etc., but to each item three possible responses are offered.

When the subject has marked all 420 of the items, the blank may be scored for any profession for which keys are available. To score for any profession, the appropriate key is superimposed upon the responses and the proper numbers on the key added to give the score. Thus, if the blank were being scored for "Advertiser," the following numbers on the Advertiser key would appear superimposed upon the above-given items:

L	I	D
2	-2	0
27	-15	-12
2	-1	-1
1	-4	2
-3	1	2

If, on the blank being scored, the above five items were marked respectively L, L, I, D, D, the result would be an algebraic adding of the quantities 2, 27, -1, 2, and 2, to the subject's Advertiser score. If, instead, these items were marked respectively I, I, D, L, L,

¹ E. K. Strong, Jr., *Vocational Interest Blank*, Stanford University Press.

the effect on the Advertiser score for this subject would be the adding of -2 , -15 , -1 , 1 , and -3 or the subtraction of 20 for these five responses. The algebraic addition of 420 such appropriate response-weights results in a single profession-score.

If now the same blank is to be scored for some other profession, say Architect, a different key is used, and consequently the same responses result in a different score. Obviously in scoring for 20 professions, 20 separate keys are used, and the above adding process is repeated 20 times.

It is clear that while the key furnished has three columns of response-weights, only one of each trio of weights is added into the subject's score. Thus the scoring for a single profession involves, essentially, the algebraic addition of a column of 420 quantities. So also, the scoring of a blank for 20 professions involves essentially the algebraic addition of 20 columns of 420 quantities each.

It is clear also that if these 20 columns of 420 quantities each were actually written down on a large sheet of paper, the top row of numbers,—that is, the first number in each column, would be completely determined by the subject's response to the first item on the blank, and that this top row could have only three forms; that is, it must be composed of all the "L" weights from Item 1 on 20 keys, or all the "I" weights, or all the "D" weights. If, for example, the subject responded "L" to the first item on the blank, this top row would be composed of the 20 "L" weights for Item 1, one such "L" weight being taken from each of the 20 profession keys. Furthermore, these

20 quantities would appear either *en bloc* or not at all, for if the subject had chosen the "I" response, then the 20 "I" weights would appear in this row *en bloc*, and had he chosen the "D" response, then the 20 "D" weights would occupy this top row *en bloc*.

Now if instead of 420 rows of 20 quantities each, we have 420 cards, each card carrying the 20 quantities of a given row, it is clear that these 420 cards would carry the quantities to be added to obtain the subject's 20 profession-scores, the top card carrying the top row of figures, and so on through the 420 cards for the 420 rows. And since each row or card must contain one of three possible combinations of quantities, it is possible to choose one of three pre-arranged cards to represent each row. Thus a stack of 420 cards can be selected from among three times that number of pre-arranged cards, so that the 420 cards chosen will carry all the quantities to be added into the 20 profession-scores for a given individual.

If now this stack of 420 cards be put through a machine which will add, say, the left-hand quantities appearing on successive cards, into a total for the 420 cards, such a total would be the score for a single profession. If the machine will add simultaneously the first and second quantities appearing on successive cards, giving two separate totals at the end, then two profession-scores will have been obtained.

The Hollerith Printing Tabulator is such a machine, and is available for use in a number of research institutions. In four-digit totals, its capacity is 10 printed totals per circuit of the cards through the machine, such circuit of

the cards being performed at the rate of 150 cards per minute. The above stack of 420 cards therefore takes somewhat less than three minutes to pass through the machine, and the result of such passage is 10 printed profession-scores, so that two circuits of the stack through the Tabulator give all 20 scores.

The details of wiring the Hollerith machine for this job would be out of place in this report, since a competent Hollerith operator is to be found wherever the machine is installed, and such operator need only be directed to total the stipulated quantities on the cards.

The arrangement to be used by the scoring clerk in selecting appropriate cards is fairly important, since upon the efficacy of such arrangement depends the amount of clerical expense involved in this part of the procedure. The cards used are the standard 45-column cards² furnished by the Hollerith agency at a very reasonable cost. These cards have a carrying capacity of 45 digits in a row horizontally, the digits being represented by holes

punched in certain positions vertically. In arranging the cards for the set-up, it is desirable to provide some means of identifying each card, as it must be replaced in the reserve supply to be used again in scoring another subject's blank. Accordingly five digits on the 45-digit card are used for such identification, one digit representing Response Number, another Section Number (in test), and three more, Item Number.

Since the Hollerith machine does not handle negative numbers, each quantity to be placed on the cards is increased by some constant large enough to make all response-weights positive, and a compensating constant is subtracted from all totals to give the net numerical profession-score. The response-weights for the Strong Blank range from -30 to +30, and in this set-up the constant quantity 30 was accordingly added to each response-weight when such weight was entered on a card.

A sample of what the cards carry may be shown by examining the card which corresponds to response "L" to Item 1. On this card appear the following 45 digits:

000013228333028242730313134312732273230293131

While these digits are not separated in any way on the card itself, the meaning of each may be somewhat clarified by here dividing the series into parts: 0/0/001/32/28/33/30/28/24/27/30/31.....

The first five digits are for card-identification. The first digit designates the response "L"; the three possible responses L, I, and D, being designated

² Hollerith equipment is also available in 80 columns. The card must be appropriate to the equipment.

on the cards by the three symbols 0, 1, and 2 respectively. This card represents the first of these responses.

The second digit represents the number of the section in which the item occurs in the test. In the Strong Blank there are nine sections: 1A, 1B, 2, 3, . . . 8, which on the cards are represented by the symbols 0 to 8 inclusive. Item 1 above is in the first section.

The next three digits taken together represent the item number in the test.

These numbers run, throughout the test, from 001 to 420. This card is for Item 001.

The next two digits represent together the weight (too large by 30) attached to response "L" to Item 1 when scoring the blank for the first profession. The next pair represent the homologous value for the second profession, and so on through 20 pairs of digits for the 20 professions.

The 20 professions scored for in this set-up were arranged in alphabetical order and are: 1. Advertiser, 2. Archi-

of cards are placed on end in three parallel compartments in a tray with all the "Like" cards in the left compartment, all the "Indifferent" cards in the middle, and all the "Dislike" cards in the right compartment. A single separator is used to separate the three kinds of cards for Item 1 from those for Item 2, and so on. The separator has two slits extending up from its bottom to allow for the partitions which separate the three compartments. This arrangement is shown graphically in figure 1.

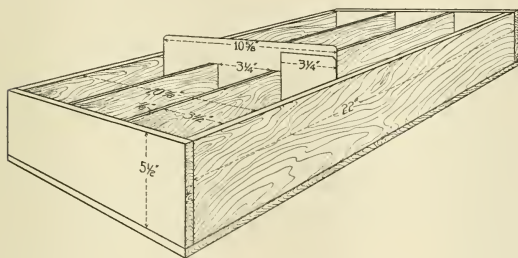


FIG. 1. TRAY TO FACILITATE SELECTION OF CARDS

tect, 3. Artist, 4. Certified Public Accountant, 5. Chemist, 6. Engineer, 7. Farmer, 8. Journalist, 9. Lawyer, 10. Life Insurance Salesman, 11. Minister, 12. Personnel Manager, 13. Physician, 14. Psychologist, 15. Purchasing Agent, 16. Real Estate Salesman, 17. Teacher, 18. Vacuum Cleaner Salesman, 19. Vacuum Cleaner Sales Manager, 20. Y. M. C. A. Secretary.

To facilitate selecting the cards appropriate to the responses on a blank to be scored, the 1260 different kinds

Actually, two such trays are used, as a single one large enough to hold the supply of cards would be too long to be easily accessible at all points. The two trays are used in tandem; that is, the cards for the first 210 items are in the first, and those for the last 210 are in the second. The reason for this seemingly large number of cards is that in order to provide for the selection and removal of a second or third stack before the first is replaced in the supply, duplicates were provided. Ten

duplicates of each kind of card are therefore available in these trays.

The complete card set-up thus consists of two trays, 420 separators, and $3 \times 420 \times 10$, or 12,600 cards.

In selecting the stack of cards for a given blank, the clerk keeps one hand on the blank, and the other at the top of the separators, removing from the compartments the cards appropriate to the responses marked on the blank. If, for example, the first five items are marked respectively L, L, I, D, D, she takes a card out of the front of the left compartment, pulls the first separator forward, takes a card from the left compartment again, pulls the second separator forward, extracts a card from the middle compartment, pulls the third separator forward, removes a card from the right compartment, pulls the fourth separator forward, removes a card from the right compartment again and so on through the blank, so that finally she has a stack of 420 cards. These she lays aside with the name of the subject and turns to the next blank to be scored.

These stacks are then run through the Tabulator and the 20 totals delivered by the Tabulator are each diminished by 12600 to compensate for the adding of the constant quantity 30 to each response-weight as mentioned. It will be observed here that the totals necessary for such scoring are larger than four digits, whereas the maximum capacity of the machine is 10 four-place totals. This difficulty is easily solved by the Tabulator operator's pressing the "Total" button on the machine when the stack is half-way through, and recording half-totals. Two such sets of half-totals will then

appear on the ribbon at the end of the operation and these may be added to arrive at the desired results.

When the stacks have been twice run through the Tabulator and the 20 profession-scores obtained, they are returned to the file-clerk, who replaces them in the trays. To facilitate this replacement process, the "Like" cards are of rose-colored stock, the "Indifferent" cards are of plain Manila stock and the "Dislike" cards are of green stock.³

The removal and replacement of cards take some time until the clerk becomes accustomed to the work. A fairly slow clerk can remove and replace 10 sets of cards per day. Such a speed delivers 200 profession-scores per day. Strong reports (in conversation with one of the writers) that his fast clerks turn out five profession-scores per hour, but not continuously. The Tabulator takes about an hour and a half to handle ten stacks of cards. This means a time expenditure of one hour per blank for the complete process at the most, to obtain 20 profession-scores. These figures are based on the scoring of 100 blanks recently for the Institute of Child Welfare, University of Minnesota.

The cost of the entire set-up, aside from Hollerith machinery, is in the neighborhood of Fifty Dollars.

A not inconsiderable feature of the method is that by sorting the stacks of cards with the Hollerith Sorter, scoring by the familiar "odds vs. evens" method may be accomplished with practically no additional expenditure

³ The writers are indebted to Dr. Melvin E. Haggerty for this idea. Hollerith cards are supplied in a number of colors.

of time, since one stack can be running through the Sorter while another proceeds through the Tabulator.

The Tabulator may also be set so as to record totals by sections of the test, and so obtain data on separate sections at little additional expense.

The method also allows for the exclusion or inclusion of any item or items at the discretion of the experimenter, by the simple expedient of removing or inserting cards into the stack before running it through the Tabulator.

Manuscript received December 28, 1929

A Vocational Survey of "Mortar Board" Graduates

BY EVELYN ROSSETTI BARBOUR, *Mortar Board Personnel Committee*

The extent to which some college women actually realize their vocational intentions is indicated in Miss Barbour's study, which supplements Miss Kerns' inquiry published in the Personnel Journal for December, 1929.

During their senior year a group of college women of the class of 1928 signified their vocational intentions. A questionnaire was sent to them after graduation to ascertain to what degree the vocational plans of these women were actually carried out. Hopes of the women are compared with accomplishments two years later. Present salaries range from \$960 to \$4160. Of 165 who returned questionnaires, only 18 say that their occupation is not the one for which they trained in college.

THIS article is really the second chapter of a vocational survey of Mortar Board seniors conducted by Miss Irene Rems in 1928. At that time senior girls from 33 Mortar Board chapters filled out a vocational questionnaire which indicated the following points: choice of occupation, necessity of earning a living, method of getting a position, specific qualifications to sell to future employer (*i.e.* major subject, etc.,) initial salary asked for, and minimum salary ascertained.

The present survey ascertains to what degree the vocational plans of these seniors were actually carried to completion after graduation.

The questionnaire was as near like the original questionnaire as possible. Answers were received from 28 out of

32 representative chapters of Mortar Board, from 165 girls out of a possible 240.

THE QUESTIONNAIRE

The following questionnaire was sent out by the Personnel committee.

1. What is your present position?
2. Is it the one for which you trained in college?
3. Have you been able to sell your specific qualifications to your employer?
4. What salary did you start with?
5. What is your present salary?
6. How did you secure your position?
 - a. Personal Application?
 - b. College Bureau?
 - c. Commercial Bureau?
 - d. Newspaper Advertisement?
 - e. Personal Introduction?
 - f. Other Method?
7. What valuable "tips" have you to suggest in applying for a position?

PRESENT POSITIONS

The answers to the questions sent out to these Mortar Board graduates were interesting and illuminating. For instance, only eight of the entire number answering the first questionnaire stated that they intended to be married immediately after graduation while the present survey shows that 25 of the group list their occupation as that of housewife. The teaching profession claims 60 of the group. There are 7 in the field of social service including three Girl Scout Directors, 1 Girl Reserve Secretary, 1 Welfare Worker, 2 Medical Social Workers, and 1 Head Resident Director in a large settlement house. Five girls are doing newspaper work. Eight hold positions as secretaries. In department store work there are 5, including 2 clerks, 1 stylist, 1 assistant sales manager, and 1 assistant training director. Three girls are doing personnel work and three are assistants to deans of women. Two girls are statisticians, 1 is a clinical assistant, 1 a tea room manager, 3 are cafeteria managers, 2 are dietitians, 1 is an organist, 1 a pianist for a national broadcasting company, 1 is a librarian, 2 are decorators, 1 is the assistant director of a civic theatre, 1 is the director of a children's theatre, 1 holds an unsalaried position as a District Governor for an International Fraternity, 1 is a life insurance agent, 1 girl is an engineer, and 1 does nothing. Twenty eight women are doing graduate work including medicine, social service, music, law, and the liberal arts. One girl is now a practicing attorney.

COINCIDENCE OF TRAINING AND VOCATION

Only eighteen women replied that their present position was not the one for which they trained in college. And even these indicated that their college training in itself was a very valuable asset. Without any specialization, these girls secured their positions because they were college people. The majority of these stated that they found their college activities to be of great help.

SALARIES

The lowest salary to begin with in the teaching profession was \$975 and the highest salary was \$2100. In all other occupations the lowest starting salary was \$600 and the highest \$3200.

The average starting salary in the teaching profession was \$1370 for ten months severice. In other professions the average was \$1450 for twelve months service.

The present lowest salary in the teaching profession is \$1000 for ten months. The highest in this vocation is \$2100. The average monthly salary in teaching among these Mortar Board girls is \$148.

The present lowest salary in all the other positions is \$960 for twelve months. The highest is \$4160. The average per month is \$166.

It is of interest to note that in the first survey the lowest initial salary asked for was \$936 and the highest initial salary asked for was \$2600.

METHOD OF APPLICATION

Fifty-seven girls obtained their positions through personal application.

Twenty-six secured theirs through a college bureau. Three girls were helped by a commercial bureau. Seventeen secured their positions through personal introductions. No girl secured a position through newspaper advertisements. The other methods listed as means of obtaining positions were: family connections, position offered by employer, recommended by department head, home town influence and "pull".

SUGGESTED "TIPS" FOR THE APPLICANT

The following statements are bits of wisdom which this group of Mortar Board girls pass on to others who are seeking positions.

Be yourself and by all means don't over-dress.

Don't feel apologetic. A firm is always looking for a good worker and if you are that, they want you.

Personal interviews are almost imperative.

Realize that practical experience is all-important.

College activities are twice as important as the college course in getting and holding a position. Cultivate them.

Don't send a profile picture.

"Shy little violets" will find that the average employer wants something more than an awfully nice girl when he is paying out cash salaries. Let the person to whom you are applying know you aren't afraid of working.

Have confidence in your own ability.

Be sincerely interested in the work you are attempting to do.

Don't be boastful but mention every bit of training you have ever had that may help you.

Have the backing of some influential person if possible.

Be honest enough to admit that there are some things for which you are not qualified.

Cheerfulness, a bit of optimism, not forgetting frankness and sincerity, are always assets.

Don't let the employer think he is doing you a favor by hiring you.

Don't get discouraged if you don't get the first job you want.

Keep on trying.

CONCLUSIONS

In drawing conclusions from the results of this survey, it is significant to note that although the teaching profession predominates among these college girls, the majority of them have found places for themselves in other fields of work. Nineteen occupations other than teaching are represented. It is likewise interesting to note that a great many of them feel the need of additional academic training beyond the four years of college. Many of the teaching positions held by Mortar Board girls are in High Schools and Colleges.

These questionnaires indicate that the greater majority of the 1928 Mortar Board members have been able to carry out their vocational preferences as indicated in the first survey. Only eighteen girls answered that they were not doing the type of work for which they had trained in college.

In the teaching profession, fifteen girls out of the sixty are receiving the same salary they started out with. Forty-five of them have had substantial increases. In other representative occupations, twelve out of the forty-three have not increased their salary. The highest initial salary asked for in the 1928 survey was \$2600. This is exactly \$1500 less than the present highest salary. Apparently

Mortar Board girls of 1928 did not state their financial aspirations too highly.

The personal application method of securing a position is much to be preferred above the others. Results indi-

cate that college bureaus do help graduates in securing positions.

It would be of value to know how this group progresses in two years more.

Manuscript received March 17, 1930

Interests and Scholastic Proficiency

BY T. A. LANGLEIE, *Wesleyan University*

Professor Langlie finds a positive relationship between scholastic success in different college subjects and relative interest in these subjects as expressed by students at time of entrance. Readers who may be surprised that this relationship between interest and accomplishment, although real, is not very close, are reminded that the data do not after all provide measures of the students' actual interest in English or mathematics, but only information as to what they said these interests were.

This study is a comparison of scholarship grades with likes, dislikes and interests, made with data obtained from the freshman class of 1927-1928 at Wesleyan University.

The freshmen indicated two school subjects which they had liked in secondary schools, two subjects which they had disliked, and some subjects in which they expected to be interested in college. These data were then compared with their grades, obtained after one semester of college work, and the following conclusions were drawn:

1. There is a tendency for individuals to obtain their best grades in those courses which they liked in secondary schools. Compared to the average of the total group, there were about one and a half to two times as many best grades obtained by the average of the selected groups as by the unselected individuals in those courses which were liked.

2. The average individual who liked certain courses in secondary schools obtained "worst" grades in similar courses in college about two thirds as often as the average of the group as a whole.

3. A dislike for a subject is not predictive of lowest grades, but students who disliked certain courses obtained their best grades in similar college courses only about half as frequently as unselected students.

4. A declaration of an expectation of interest in a particular course is not as valid for purposes of prognosis as is an indication of one's likes or dislikes obtained from experience, and yet there is value in such statements of interest. Students who expected to be interested in particular courses obtained their best grades in those courses about 170 per cent as frequently as unselected individuals, and obtained their lowest grades in such subjects about 70 per cent as often as randomly selected individuals.

THE purpose of this study is to analyze the relationship which exists between interests of college students, as expressed when they enter college, and their subsequent scholastic proficiency in such courses. One of the greatest needs in educational and vocational guidance is for

some measure of the extent to which an individual will use what ability he may have. Satisfactory tests of intelligence and trade knowledge have been devised, but very little has been accomplished in the measurement of human dynamics. Hence a study such as the one here described should have some practical value for the educational adviser, the vocational guidance expert, the teacher, and for students and society in general. If we can be sure that Woodworth's assumption that "human interests keep pace with human capacities,"¹ is true, and if we can obtain adequate measures of "human interests", personnel work will have advanced considerably in the attempt at adjustment of human effort to tasks where efficiency will result. This study contributes toward the verification of the above assumption.

Similar studies by Thorndike² and King³ show a relationship between interests and scholarship, but they are not conclusive, partly on account of the retrospective nature of the data, the subjectivity of measures of interests and ability, and a confusion between cause and effect. A student may indicate the course in which he received his

best grade as the course in which he was most interested, whereas his interests might have been due to the ease of getting a good grade. For prognostic purposes, such data obtained *after* courses have been taken, are largely valueless. Wilson's⁴ results are partially free from such confusion and yield "moderately high positive correlations."

METHOD

The data for this study were obtained from personnel record cards which were filled out by the freshman class of 1927-1928, Wesleyan University. Each entrant was requested to indicate the names of two subjects taken by him in secondary schools that he had liked most, and to indicate two subjects which he had disliked most, or liked least. He was also requested to name some subjects in which he expected to be interested in college, and named one, and sometimes two, three, or four subjects. These statements of likes, dislikes, and interests were classified according to the following fields or types of subject: English, mathematics, ancient languages, modern languages, social sciences, and natural sciences. These fields correspond to courses taken by most freshmen during their first semester of residence.

The college records of these men were obtained after they had completed one semester of study, and these records were compared with their statements of likes, dislikes, and interests. The percentage of individuals

¹ R. S. Woodworth, *Dynamic Psychology*, Columbia University Press, New York, 1918, p. 74.

² E. L. Thorndike, *The Permanence of Interests and their Relation to Abilities*, *Popular Science Monthly*, 1912, vol. 81.

Early Interests; their Permanence and Relation to Abilities, *School and Society*, 1917, vol. 5.

The Correlation Between Interests and Abilities in College Courses, *Psychological Review*, 1921, vol. 28.

³ I. King, *Permanence of Interest and their Relation to Ability*, *School and Society*, 1917, vol. 6.

⁴ M. O. Wilson, *Interest of College Students*, *The American Journal of Psychology*, 1927, vol. 38.

who obtained their best grades in each of the various courses as enumerated above was computed. The percentage of men who obtained their best grades in the field of study which they had liked in secondary schools was also computed. The same data were obtained about each of the other "preference" (dislikes and expectations of interest) groups, and these percentages were compared with the percentages of unselected individuals who obtained their best grades in each of the various fields of study. Thus, if a larger percentage of the group who had liked English obtained best grades in English courses, there is evidence that a liking for English as taken in secondary schools increases one's chances of getting one's best grades in English courses in college. The same reasoning holds for each of the other fields. The ratio between the percentages of selected individuals and the percentages of unselected individuals represents the probability that a selected student will obtain his best (or his worst) grade in a particular type of course, as compared to an unselected student, selection being on the basis of indications of likes, dislikes and interests.

RESULTS AND DISCUSSION

The results obtained indicate that there is a relationship between statements of interest and grades obtained in single courses; and the relationship is probably significant enough to be of value to an adviser or personnel man. There is a tendency to obtain one's best grades in those courses which were liked in secondary schools, and to get lower grades in those courses which were disliked in secondary schools.

The following tables present the results of this study in detail. In these tables, "unselected" group refers to the group as a whole, including those individuals who comprise each "selected" group. The "selected" groups are those who were selected on the basis of interests. Each table presents the results as obtained from 172 freshmen, but each individual named more than one preferred or disliked subject, and some individuals had more than one "best" and more than one "worst" grade. Hence the percentages are based on the number of comparisons given in table 1.

These figures represent the absolute frequency of "best" and "worst" grades in each of the various fields of study. Thus 31 men, 14 per cent of the total group, obtained their best grades in English courses, and 51 men or 22.6 per cent obtained their worst grades in the same courses. The size of each percentage is determined by the number of students taking each subject as well as by the ease of obtaining high and low grades in each course.

The figures in table 2 represent the percentage of each selected group who obtained their best or worst grade in the various courses. Thus, 22 per cent of the group who liked English as taken in secondary schools, obtained their best grades in English courses in college. Twenty-eight per cent of the same group obtained their worst grades in college English courses.

In order to measure the effect of interest, positive and negative, on scholarship, comparisons must be made between the selected groups, represented in table 2, and the unse-

TABLE 1

Distribution of best and worst grades in the various fields of study. Unselected group

		COURSES						TOTAL
		Eng.	Math.	Anc. L.	Mod. L.	Soc. S.	Nat. S.	
Best	n.....	31	42	21	58	29	41	222
	per cent.....	14.0	18.9	9.5	26.1	13.1	18.5	100.1
Worst	n.....	51	35	14	52	25	49	226
	per cent.....	22.6	15.5	6.2	23.0	11.1	21.7	100.1

TABLE 2

The percentage of individuals selected on the basis of "likes," "dislikes" and "interests," who obtained their best grades in the various fields of study

NATURE OF SELECTION	COURSES						AVER.	MED.
	Eng.	Math.	Anc. L.	Mod. L.	Soc. S.	Nat. S.		
Liked.....	22	36	32	44	22	26	30.3	29.0
Disliked.....	11	8	5	10	4	12	8.3	9.0
Interested.....	16	36	28	39	22	25	27.5	26.5

The percentage of individuals selected on the basis of "likes," "dislikes," and "interests" who obtained their worst grades in the various fields of study

NATURE OF SELECTION	COURSES						AVER.	MED.
	Eng.	Math.	Anc. L.	Mod. L.	Soc. S.	Nat. S.		
Liked.....	28	13	4	14	2	17	13.0	13.5
Disliked.....	24	14	7	25	17	24	18.5	20.5
Interested.....	23	16	0	17	7	17	11.7	11.5

TABLE 3

The ratios between the percentage of unselected and selected individuals who obtained their best grades in the various courses. (Obtained from tables 1 and 2)

NATURE OF SELECTION	COURSES						AVER.	MED.
	Eng.	Math.	Anc. L.	Mod. L.	Soc. S.	Nat. S.		
Liked.....	157	190	337	169	168	141	193.7	168.5
Disliked.....	79	42	53	38	31	65	51.3	47.5
Interested.....	114	190	295	149	168	135	175.2	158.5

The ratios between the percentage of unselected and selected individuals who obtained their worst grades in the various courses. (Obtained from tables 1 and 2)

NATURE OF SELECTION	COURSES						AVER.	MED.
	Eng.	Math.	Anc. L.	Mod. L.	Soc. S.	Nat. S.		
Liked.....	124	84	65	61	18	78	71.7	71.5
Disliked.....	106	90	113	109	153	111	113.7	110.0
Interested.....	102	103	60	74	63	78	70.0	76.0

lected group represented in table 1. If a greater percentage of the selected groups obtain their best grades in courses which interested them, we have an indication that interest in particular subjects is prognostic of relatively superior work in these courses. Likewise, if a smaller percentage of those who disliked certain subjects obtain their best grades in those courses, we have further evidence that negative interests are detrimental to success in the disliked course.

Such comparisons are presented in table 3.

The figures in these tables are ratios between the percentage of best and worst grades obtained by the unselected group, and the percentage of best and worst grades obtained by the selected groups in each course. A ratio of 100 means that the selected group is not different from the unselected group in the matter of number of best or worst grades. As the ratio increases over 100 the percentage of the selected group is greater than the percentage of the unselected group, and as it is less than 100, the percentage of the selected individuals is less than the percentage of unselected individuals. These figures should be read: the selected group is to the unselected groups as () is to 100, the blank being filled in by the figures in table 3. Thus, relative to the size of each group, 157 per cent as many of the group who liked English as of the unselected group obtained their best grades in the English courses.

According to the tables presented above, there are rather marked differences in the frequency of "best" and "worst" grades given by the various departments. There is also a rather marked variability in the frequency of particular interests. But the ratios between the frequency of best grades obtained by the unselected group and the frequency of best grades obtained by the selected groups are not as variable. The extreme deviation in the case of ancient language courses may be accidental, due to the small number of persons interested in ancient language courses, and the small number of "best" grades obtained in such courses.

The most accurate type of prediction, on the average, is the prediction of lack of best grades in subjects which students disliked in secondary schools. About twice as many unselected individuals as individuals selected on the basis of dislikes obtained their best grades in these particular courses. The next most accurate prediction, on the average, is the prediction that students who like certain subjects will obtain their best grades in those courses.

The conclusions of this study have been summarized in the author's abstract at the beginning of the article. In general they tend to confirm earlier research, and Woodworth's statement that "interests keep pace with . . . abilities."

Manuscript received April 16, 1930

The Personnel Research Federation in 1930

Annual Report of the Director

By W. V. BINGHAM, *New York*

Within the coming year will occur the tenth anniversary of the founding of the Personnel Research Federation. During the Federation's ninth year, distinct progress has been made in character and influence of meetings held, and in activities of members and of staff. These include scientific contributions to the understanding and improvement of employee relations; aids to employment, personal appraisal and the planning of careers; betterment of mental health and attitude in school and in industry; causes and cure of proneness to accident; and studies of environmental conditions, training, and occupational adjustments in stores, offices, and factories, in government bureaus, and in social and religious agencies, at the executive level as well as among workers and supervisors.

THE ninth year of the Personnel Research Federation began with a strong impetus. The Annual Fall Conference, held at headquarters in the Engineering Societies Building in New York, November 15 and 16, 1929, brought together a record attendance of 224, including major executives of large industries as well as personnel specialists and investigators, to share in an exceptionally stimulating program. Addresses and discussions centering around the industrial investigations in progress since 1927 at the Hawthorne Works of the Western Electric Company illustrated the worth of carefully conducted experimental studies of factors affecting the earning power and satisfactions of employees. These meetings, together with the subsequent publication of papers by G. A.

Pennoek, M. L. Putnam, and Elton Mayo, have drawn the attention of many industrialists to the importance of such a scientific approach to the practical problem of improving employee relations. In a quite different field, namely that of national religious and social organizations, reports of personnel investigations in the churches and in the National Council of the Young Men's Christian Association showed the value of factual studies as a basis for choosing and training personnel for leadership in such organizations.

At our February meeting, held this year in Atlantic City jointly with the National Association of Placement and Personnel Officers, the National Vocational Guidance Association and other organizations, the attendance for pre-

vious years was far surpassed. Of peculiar interest to our membership was the report by Donald S. Bridgman on studies of the relationships between participation of 2100 college men in campus activities and athletics, and subsequent success of these same men in the Bell system. For this corporation, perhaps the largest employer of college men, undergraduate scholarship remains the best single index on the basis of which to forecast future progress, although other indices also have some validity, notably substantial achievement in public speaking, editorial work, or managerships; but athletic prowess and membership in musical clubs prove to be of little importance in predicting future accomplishment with this company. The fact that a student has earned part or all of his expenses surprisingly gives no indication as to relative success after graduation.

The First International Congress for Mental Hygiene which met in Washington, D. C., May 5-10, 1930, marked an epoch in the world movement for better mental health. Organized by the National Committee for Mental Hygiene, one of our charter members, it had the participation of many of our most active members, some of whom contributed addresses and discussions dealing not only with mental hygiene in industry, but also with mental hygiene aspects of school and college life, and fundamental questions of personality adjustment. Coming as it did at the time of year when the Personnel Research Federation ordinarily schedules its Spring meeting, this Congress made inadvisable the holding of such a session this year.

CHANGES IN OFFICERS AND STAFF

On March 10th, 1930, Dr. L. J. O'Rourke, Director of Personnel Research of the U.S. Civil Service Commission, became President of the Personnel Research Federation, succeeding Alfred D. Flinn. As Vice-President, to succeed Donald Scott, Dr. Harvey N. Davis, President of Stevens Institute of Technology, was elected. New members of the Administrative Board elected at this time are V. V. Anderson, M.D., of R. H. Macy and Company; Ordway Tead, of Harper and Brothers; Elliott Dunlap Smith, of Yale University; and Florence C. Thorne, of the American Federation of Labor. The other officers and members of the board have continued without change, as has the central staff except that Dr. A. H. Sutherland resigned in October and Margaret McNamara in January, to undertake personnel work elsewhere.

ACTIVITIES OF MEMBER ORGANIZATIONS

The work of the forty business firms, educational institutions, government agencies, national associations and bureaus which make up the Personnel Research Federation has been so varied that no comprehensive summary is attempted here. Major developments selected as representative are mentioned, and the reader is referred to the columns of the Personnel Journal and the Personnel Service Bulletin for more adequate statements of what these organizations have been doing to further personnel research.

Engineering Foundation has given encouragement and support to investigations designed to improve the instrumentalities for measuring accomplish-

ment as well as native abilities and interests of engineering students, as one step in the improvement of engineering education and the orientation of young men with reference to the engineering profession. It has substantially increased its financial support of the work of the Personnel Research Federation.

The *National Research Council* held on May 9th and 10th a conference on individual differences at which forty research workers surveyed the progress made since the war, and debated the relative importance of future investigations of a fundamental nature.

The *American Federation of Labor* has encouraged experiments in union-management coöperation in the textile as well as the transportation industries, and has promoted extension of the five-day week, particularly in the building industry.

The *United States Bureau of Labor Statistics* has prepared a revision of a brochure originally issued in 1921, listing and describing the many agencies, public and private, engaged in the work of personnel research. In addition to its customary services in compiling current labor statistics, the Bureau has continued the issuance from time to time of special bulletins on care of aged persons in the United States; causes of death by occupations; and studies of hours and wages in different industries, such as steel and transportation.

The *United States Civil Service Commission* has performed a service to commerce, industry, and education by releasing for general use in businesses and schools certain well standardized

tests of intelligence and of clerical abilities.

The *United States Public Health Service* has taken a step of great significance for the future in establishing a National Institute of Health. For site and buildings for this research center Congress has made an appropriation of \$750,000, and the Chemical Foundation has made an initial donation of \$100,000 for research fellowships.

The *Industrial Health Conservancy Laboratories* of Cincinnati have been engaged in the investigation of many health hazards, some of which have psychological as well as physiological aspects.

The *Vocational Service for Juniors* has made a revision of its useful monograph on opportunities for vocational training in New York City. It is now launching a program of intensive training, both theoretical and practical, for vocational counselors.

The *Bureau of Personnel Administration* has continued its activities in formulating principles and in educating executives as to the philosophical and ethical bases of sound personnel practice.

The *Scovill Manufacturing Company* has extended its investigations of employment tests. They are proving to be of most value in the selection of apprentices and clerical employees.

In the colleges and universities, many investigations in both industrial and educational personnel have been completed. The Research Bureau for Retail Training at the *University of Pittsburgh* has been prolific of solid output for store executives and personnel

directors. Among thirty projects we may mention particularly one prepared for the National Retail Dry Goods Association on Induction of the New Executive, covering employment and incentives as well as problems met in familiarizing the new executive with his store and his work. The University has contributed much to the progress of the state-wide study of educational achievement in which the colleges and secondary schools, the State Department of Education and the Carnegie Foundation are cooperating. *Stanford University* has continued its leadership in the study of professional attitudes and bent, and of methods for selecting superior students from among applicants for admission. *Harvard University* has put its alumni placement service on a sound footing, and has added to the college faculty a Consultant on Careers. Basic researches on industrial fatigue in relation to changes in the blood stream and to other phenomena, physiological and psychological, are being continued in the laboratories of the Graduate School of Business. *Yale University* has under way a comprehensive long-time research on measurement of student abilities and prediction of achievement. Its personnel office continues to add to available sources of career information and to the techniques of counseling and placement. The human problems of industry are finding their place in the program of the Institute of Human Relations. At the *University of Pennsylvania* an unusual number of investigations have been in progress. In addition to those by Rex Hersey and M. S. Viteles which have been published in the PERSONNEL

JOURNAL, mention may here be made of the highly significant volume by Anne Bezanson, on Wage Methods and Selling Costs, reporting extensive studies made in coöperation with the National Retail Dry Goods Association. A new inquiry into seasonal unemployment, looking toward the development of means of stabilizing employment, has been financed and is now in process of organization. A major research on Skill and Specialization has come from *Bryn Mawr*. *Princeton* has issued, through its Industrial Relations Section, a useful memorandum on Age Limitations in Industry. *Syracuse* and *Chicago* have continued to improve techniques for measuring group opinion and attitudes, and have been active in both educational and industrial personnel studies. *Michigan* has recaptured Professor Yoakum who as Vice-President of the University and Director of Educational Investigations now has a unique opportunity to further basic personnel research and experiments in administration. *Vassar*, *Wellesley*, *Mt. Holyoke* and *Brown*, pioneers in student personnel work, have continued their studies and their services to undergraduates. At the *University of North Carolina* Francis F. Bradshaw has made a fresh study of rating scales with particular reference to personality ratings. *Northwestern University* has been pioneering in studies of the personnel of its faculty of liberal arts. *Stevens Institute of Technology* is experimenting with psychological tests individually administered, as aids in student appraisal.

The activities of the *Boston Elevated Railway* and of the *Eastern Massachu-*

sets *Street Railway Company* in accident prevention have been demonstrating that accidents can be controlled to a much greater extent than has been usually supposed. These studies have significance for the general public, confronted by a steadily increasing number of deaths and injuries from traffic accidents. Since the central staff of the Personnel Research Federation has had closest participation in these studies, they will be enlarged upon in a later section.

WORK OF THE STAFF

The duties of the staff of the Personnel Research Federation are first of a personal sort,—correspondence and consultation with individual and corporate members of the Federation regarding their research problems. The Director and the Associate Director have spoken before university audiences, delivered public addresses in ten cities, and participated in many conferences, large and small. Through such contacts as well as through its regular meetings and its committee activities, the Federation accomplishes much of its purpose to further and to coördinate research activities.

A similar purpose is behind the editorial work devoted to the PERSONNEL JOURNAL, the *Personnel Service Bulletin*, and other publications issued from time to time. As indicating trends it is interesting to note that of 33 contributions appearing in Volume VIII of the PERSONNEL JOURNAL fifteen bear upon personnel research in industry; five, in business; five, in education; and two, in public service; while six are of a general nature. The author of one article secured 5000 reprints for

distribution. The editorial board of the Journal has been strengthened through the addition of Douglas Fryer as book review editor, and of M. S. Viteles who will have special oversight of publications relating to employment tests. Linda H. Morley, Librarian of Industrial Relations Counselors, Inc., has continued to prepare the annotated references to current periodical literature, and has also served as chairman of the joint committee of the Personnel Research Federation and the Special Libraries Association on Classification and Terminology for Industrial Relations Libraries. Both the Personnel Service Bulletin and the Personnel Journal have in the past year gained in circulation among non-members as well as members of the Federation, indicative of a steadily growing interest in the scientific attack on problems of occupational orientation, employment, training, supervision, and indeed the whole gamut of relationships of the individual to his vocational preparation, to his work, to his fellow workers, to his supervisors, to his employer, and to those conditions, material and social, both in and out of working hours, which affect his competence, his accomplishment and his satisfactions.

During the past year the staff has continued an investigation of the *personal interview*, its uses, techniques, and reliability, with special reference to fact-finding in industrial investigations. The technical literature and the personal experience of interviewers not only in industrial research but also in the fields of legal evidence, clinical practice, commercial surveys, banking, employment management,

journalism, social case work, educational and vocational counseling, and anthropological field investigation were freely drawn upon. The findings have practical implications for interviewers in these several fields, as well as for those whose primary concern is the improvement of social and industrial research. Experiments in interviewing made in connection with various industrial, commercial, educational and social inquiries confirmed the usual skepticism regarding reliability of many objective data gathered in this way, but showed a much higher reliability of two classes of data: statements as to objective facts which the person interviewed has a strong motive for knowing and remembering, and statements revealing subjective facts of personal attitude. The need of sincere frankness on the part of the interviewer as to his purpose, as well as of skill in planning his interview and in wording his questions so that they are correctly understood and free from implication or suggestion, has been repeatedly emphasized. This study has made possible a charting of pitfalls some of which had not previously been noted. These, together with many difficulties familiar enough to experienced interviewers, are described in a forthcoming volume on *The Interview*, which also indicates ways in which these difficulties may in a measure be forestalled or controlled.

One of the by-products of this study which is supplying a real need is an eight-page form called *Aids to the Vocational Interview* designed to systematize interviews with adults who are planning their careers.

The manuscript of a volume describ-

ing studies on *Workers' Restriction of Output*, completed during the previous year by S. B. Mathewson under the sponsorship of the Federation, has been revised and should be published shortly.

The Director and staff have been able to meet a variety of calls for information and counsel by agencies and by university and business authorities contemplating developments in their personnel programs. Outside of our own membership we have coöperated with national associations such as the Social Science Research Council, the American Council on Education, the Taylor Society, the National Vocational Guidance Association, the Psychological Corporation, the National Electric Railway Association, and the National Safety Council, and with agencies such as the J. C. Penney Foundation, the Vocational Adjustment Bureau, the New York State Department of Labor, and the Massachusetts Committee for Mental Hygiene. For the Girl Scouts, Inc., we have prepared a graphic scale for rating camp directors and a systematized check list of 78 points about the camp and its management, to be rated by inspectors when grading camps. This report form is being widely used in educating supervisors and camp directors regarding standards of good layout and management, as well as in securing information needed at headquarters, district and national.

Our first duty, however, is to our own corporate membership. Indeed our contacts with other agencies have the purpose of building up information wanted by members, as well as of furthering in general the advancement of

personnel research. Technical service, consultation, and *demonstrations of the practical value of the results of research* are increasingly prominent features of the work of the Federation's staff.

PERSONNEL RESEARCH AND ACCIDENT PREVENTION

The chief demand for staff services has continued to come from the transportation industry in connection with the humanly and financially serious problem of reducing accidents. We have published several articles growing out of this work and a brochure entitled *Safe Transportation* which briefly summarizes the history of three years of study and service on the surface and bus lines of the Boston Elevated Railway, where the benefits of personnel research,—not in the initial selection of employees to be trained, but in the study and improvement of operation of experienced but accident-prone workers,—have been strikingly demonstrated. Here a thirty-five per cent reduction of accidents was effected in less than two years, an achievement for which the Railway was awarded last January the Anthony N. Brady Memorial Gold Medal; and since that time, a budgeted further reduction, substantially below the minimum level previously reached, has been attained month after month. To quote Dr. Slocombe who has been devoting his unusual abilities and his entire energy to this work, "Accidents *can* be controlled." The methods developed in Boston to that end, grounded in thorough scientific studies of the human factors involved, have been applied with benefit on other transportation lines, and are equally applicable in in-

dustrial plants, mines, or wherever large numbers of workers face occupational hazards.

Indeed, the annual national tragedy of 31,000 persons killed by automobiles,—not forgetting a million personal injuries and vast property damages from motor vehicle accidents,—presents a major problem in the national economy which in my judgment ought to be faced and to a substantial degree mastered by a fresh attack, closely similar to the one which we have found to be so effective in reducing motor bus and street car accidents in Boston, Quincy, Lynn, Lawrence and other communities. Without any relaxation in the use of controls already being applied by state and local authorities, public schools, safety councils and other agencies, additional measures for accident prevention should be adopted which go deeper. They must be founded on an understanding of individual differences among drivers and on extensive detailed studies of those causes, simple and complex, obvious and obscure, which lead to human failure in an emergency. And the aim should be, not to try to bar any large fraction of the driving public from the use of automobiles, but rather to isolate, diagnose and *cure* susceptibility to accidents. Here as in management generally there is less need of a restrictive negativistic attitude reminiscent of the Hebraic "Thou shalt not," and more need for definitely constructive help in the spirit of the Teacher who pointed toward a better way, saying, "This do and thou shalt live."

Preliminary inquiries have indicated that about two-thirds of the drivers involved in fatalities in Massachusetts

might have been identified in advance from the records as more than ordinarily susceptible to accidents. Considerably more than half of these were doubtless quite capable of becoming safe operators, provided they had had the benefit of specific diagnosis of their particular weaknesses, and equally specific help in correcting or compensating for these defects.

Among high-accident employees whom we have studied in this way, the basic causes of accident proneness are found to classify largely under three main headings: (a) primarily matters of knowledge or skill which can be taught; (b) matters of attitude, personality or character, likewise capable of modification for the better; and (c) health, eyesight and other physiological conditions, many of which have yielded to appropriate treatment. The most amazing fact as yet brought to light is the small proportion of the accident prone,—scarcely four per cent,—who have not as yet shown improvement. The inference is obvious. If industrial employees can in such large measure be helped to competence and carefulness, accident-prone drivers among the general public who are now a menace to everyone who uses the streets, should also have an opportunity to become safe operators. Not one of these drivers wants to have accidents. But he lacks skill or self control or correct knowledge of just what the price of safety is, in his particular case. This kind of safety service the

state will one day provide, just as it supplies scientific help in the control of typhoid. Meanwhile it is the duty of agencies such as the Personnel Research Federation to continue to lay better and better foundations of scientific knowledge regarding human nature in relation to safety. We must also,—without waiting for more complete understanding of all the more obscure causes of human failure in emergencies,—undertake to apply what is already known, and here and there, as opportunity offers, make practical demonstrations of what can and should be done now to reduce the appalling sacrifice of life we are paying in exchange for motor vehicle transportation.

CONCLUSION

The frontiers of knowledge about “man in relation to his occupations and his education therefor” are not advanced by wholesale indiscriminate efforts, but by specific inquiries, each directed toward a definite problem that has significance for practice, as well as theoretical implications. We have seen over how wide a front and in how many ways such problems are being attacked by members of the Personnel Research Federation and by organizations with which we are in active coöperation. The Federation in 1930 has been doing all that its resources have made possible to encourage and coördinate these efforts and to spread widely a knowledge of results achieved.

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News Notes

PERSONNEL RESEARCH FEDERATION

Annual Fall Conference

*Thursday, Friday and Saturday,
November 13, 14 and 15, 1930*

Present plans for the Ninth Annual Fall Conference of the Personnel Research Federation call for sessions extending over parts of three days, beginning Thursday afternoon, November 13, and continuing through Saturday forenoon, November 15. Papers and addresses already scheduled insure a program of great interest, not only to personnel managers and personnel research workers, but to major executives as well.

Thursday, November 13

The session on Thursday afternoon will be devoted entirely to problems of personnel administration in hotels. There has been much discussion recently among hotel executives regarding their excessive labor turnover, the Old Man of the Sea on the back of the hotel industry; Dr. Richard S. Uhrbrock, late of the Cornell University School of Hotel Administration, and an authority in personnel management, will speak on *The Installation of Personnel Administration in a Hotel*. Several hotel executives of national reputation who have done outstanding things in the way of training employees, improving their health, reducing accidents, centralizing employment and otherwise bettering their personnel management, will describe what they have done and how they did it.

From 6:00 to 7:30 p.m., Dr. H. C. Metcalf, Director of the Bureau of Personnel Administration, invites the members of the Conference to hear a discussion on *Responsibility of Management for Sound Human Relations*, led by Henry P. Kendall, of the Kendall Company.

The evening will be free for dinner and theatre engagements.

Friday, November 14, 9:30 a.m.

The second day of the conference will start with a paper on *Personnel Administration in the General Motors Corporation*, by N. F. Daugherty, Director of Industrial Relations.

The decentralized structure of the General Motors Corporation and of its personnel activities will be outlined with emphasis on the policy which recognizes that every executive is a personnel executive, directly responsible for the training and the morale of his own men. Special features of General Motors personnel practice will be described, such as bonus, stock subscription, and other compensation plans; methods of selecting, transferring and promoting executives; methods of rating and measuring progress of executives; training of foremen and others; the General Motors Institute of Technology.

The remainder of the morning session and the full afternoon session will be devoted to reports by staff members of the Research Bureau for Retail Training, of Pittsburgh. Following a discussion by the Director, David R. Craig, on the history, accomplishments, and problems of the Bureau, other members of the staff will tell of specific projects and investigations. While the work done by the Bureau is of special interest to department store executives, it is so sound and fundamental as to command the attention of all. Further details of this program will be published soon.

Prominent speakers will address the Dinner Meeting, which is to take place on Friday evening at seven.

Saturday, November 15, 9:30 a.m.

On Saturday morning M. L. Putnam of the Western Electric Company will sup-

plement the report on the Hawthorne works made at these meetings last year, by telling what has been found out since that time about interviewing employees and training supervisors.

This will be followed by three papers concerning attitudes and their measurement:

The Field for Attitude Measurement, by J. David Houser.

The Evaluation of Specific Beliefs and Attitudes, by Raymond Franzen.

A Test of Morale: Administration and Results, by H. R. Halsey.

All sessions of the conference, except the Thursday afternoon session and the dinner meeting, will be held in the Engineering Societies Building, 29 West Thirty-Ninth Street, New York City.

BUREAU OF PERSONNEL ADMINISTRATION

Business Management as a Human Enterprise is the general topic to be followed by twenty-five prominent specialists scheduled to lead this year's Thursday Evening Course of the Bureau of Personnel Administration. The objects of these conferences are "through research, discussion and publication, to develop—for the common benefit of employers, managers, workers, and society—integrated thinking and constructive direction of the basic principles of business administration and management."

The imposing list of speakers, each of whom will lead one Thursday evening conference, follows: Harry A. Overstreet, Sumner H. Slichter, Harlow S. Person, H. H. Broach, Henry P. Kendall, Lew Hahn, William E. Wickenden, A. A. Berle, Jr., Ivy Lee, Charles R. Mann, John M. Clark, Walton H. Hamilton, Lawrence A. Schoen, Paul Cherington, Walter V. Bingham, J. David Houser, William M. Leiserson, Henry C. Metcalf, Erwin H. Schell, Elliott Dunlap Smith, Eduard C. Lindeman, Joseph H. Willits, Ordway Tead, T. V. Smith.

The Conferences will be held at the Engineering Societies Building, 29 West 39th Street, New York City, Thursday evenings, from 6:00 to 7:30, October 16, 1930, to April 30, 1931.

Further information may be obtained by

addressing Dr. Henry C. Metcalf, Director, Bureau of Personnel Administration, 420 Lexington Avenue, New York City.

UNITED STATES PUBLIC HEALTH SERVICE

A National Institute of Health has been established by the United States Public Health Service. Congress appropriated \$750,000 for a site and building, while the Chemical Foundation has made the first non-governmental donation of \$100,000 for research fellowships. The establishment of this Institute as a research center to ascertain the cause, prevention, and cure of disease, industrial and otherwise, is a notable step forward.

INDUSTRIAL RELATIONS COUNSELORS

The Industrial Relations Counselors, Incorporated, has been engaged to conduct a study of employment and general wage scales at Harvard University. Arthur H. Young, secretary of the New York research organization, will direct the study, which is scheduled to begin in October.

THE INQUIRY

It has been announced that The Inquiry will continue its existence to study conference methods and techniques during the next two or three years. Some questions to be attacked follow:

What are the problems people most frequently meet in preparing, directing and following up conferences?

What are the different kinds of objectives for conference process?

What are the criteria for judging educational, administrative and integrative conferences?

How can conferences be appraised by the ordinary delegate?

How can administrative conferences be made democratic and educational?

What are the most effective ways of collecting preliminary information and documents for use in a conference, and in what form are these data best presented to the delegates?

How may the presentation of information be subordinated to the discussion of problems?

What techniques can be used to forestall or minimize time pressures?

How may a conference be kept flexible to fit the cycles of interest within it?

CAREER INFORMATION FOR COLLEGE STUDENTS

Those interested in college personnel work must be interested in Charles Gilbert Wrenn's article, *Career Information for College Students*, in the June 21 number of *School and Society*. After pointing out the unfortunate connotation to college students of the term "vocational guidance," the writer gives an excellent summary of available sources of career information.

COLLEGE PERSONNEL OFFICERS

The annual fall meeting of the College Personnel Officers will be held at Oberlin College, Oberlin, Ohio on Monday and Tuesday, October 27 and 28, 1930. The program, as planned to date, follows:

October 27

8:30 a.m.

Registration and address of welcome by Dr. E. H. Wilkins, president of Oberlin College.

9:30 a.m.—12 noon.

Paper on *The Testing Program in College Personnel Work*, by Dr. H. A. Toops of Ohio State University.

2:00 p.m.—5 p.m.

Paper on *The Mental Health of College Students*, by Dr. Frankwood E. Williams, Medical Director, The National Committee for Mental Hygiene.

Paper on *Developing the Student's Personality*, by Dr. G. H. Estabrooks, Colgate University.

6:30 p.m.

Banquet and address.

October 28

9:00 a.m.—10:30 a.m.

Papers on *Techniques of Vocational Counseling on the College Level* by Dr. Edward S. Jones, University of Buffalo,

and by another speaker to be announced.

10:30 a.m.—12 noon.

Papers on *Techniques of Coordinating Student Personnel Activities*, by: Dr. Mabelle A. Blake, director of personnel, Smith College; Dean Robert C. Clothier, University of Pittsburgh; Dean D. S. Hanchett, Antioch College

All inquiries concerning the conference and requests for reservations should be sent to J. Anthony Humphreys, director of personnel service, Oberlin College, Oberlin, Ohio.

PLACEMENT AND PERSONNEL OFFICERS

The report of the 1930 meetings of the National Association of Placement and Personnel Officers may be secured from Miss Elizabeth M. Steel, Ohio Wesleyan University, Delaware, Ohio, at \$1.50 a copy.

CARNEGIE FOUNDATION

The Carnegie Foundation for the Advancement of Teaching has recently published *The Social Philosophy of Pensions* by Henry S. Pritchett, President of the Foundation. An important section is devoted to a review of existing pension systems for professional groups.

PERSONALITY TRAITS AND DIFFERENT PROFESSIONS

According to J. F. Dashiell in his article in the June number of *Applied Psychology*, a teacher preparing students for one profession is little more likely to agree with a colleague in the same line concerning personal and character traits making for success in that profession, than with a teacher preparing students for a very different profession.

This conclusion is based on a study in which teachers of medicine, commerce, teaching, engineering, and law rated twelve character traits according to their importance in achieving success in their professions.

The author points out that—"In current discussions of the analysis of vocations on

the one hand, and the analysis of individuals on the other, an oversight of what should be a fairly obvious point is not infrequently to be observed. It might be styled the fallacy of distinct professions."

BUSINESS AND THE SCHOOLS

Under the title *The Necessity of Closer Relations Between Business and the Schools*, Cameron Beck, Personnel Director of the New York Stock Exchange, has collected from a large number of personnel managers their suggestions concerning chiefly the product of commercial schools. Many sound suggestions are given for improving the relations between the schools and business. This paper, published by the National Education Association, was presented before the Columbus Convention of that organization on July 1, 1930.

FORTHCOMING MEETINGS

SEPTEMBER 29-OCTOBER 4. *Nineteenth Annual Safety Congress*. National Safety Council. Pittsburgh, Pennsylvania.

OCTOBER 11. *Annual Business Meeting, Corporate Members*. PERSONNEL RESEARCH FEDERATION. New York City.

OCTOBER 27 AND 28. *Annual Fall Meeting, College Personnel Officers*. Oberlin College, Oberlin, Ohio.

OCTOBER 29-NOVEMBER 1. *Annual Convention of Civil Service Assembly of U. S. and Canada*. Chicago.

NOVEMBER 13-15. *Annual Fall Conference*. PERSONNEL RESEARCH FEDERATION. New York City.

PERSONAL ITEMS

DAVID ALLEN ROBERTSON has accepted the presidency of Goucher College. Dr.

Robertson has been assistant director of the American Council on Education, Washington, D. C., since 1924.

At Yale University, MARK A. MAY has been appointed director of the statistical bureau of the Institute of Human Relations; WALTER R. MILES and CATHERINE COX MILES of Stanford University have been appointed research associates in psychiatry and psychology for one year.

TRUMAN LEE KELLEY, Professor of Education and Psychology at Stanford University since 1926, has accepted an appointment as Professor of Education in the Graduate School of Education, Harvard University. Professor Kelley will offer at Harvard courses in Advanced Statistical Method and a Seminary in Psychometrics. His special research interest lies in the analysis of mental structure and functions.

R. O. BECKMAN has recently been appointed Personnel Director of Wise Shoes, Incorporated, of New York City. Previous to this he was Personnel Director of the Kroger Grocery Company.

HENRY BEAUMONT has left the Chase National Bank of New York City to become Executive Secretary of Student Personnel Service at the University of Kentucky.

RICHARD S. UHRBROCK has joined the Procter and Gamble Company, Ivorydale, Ohio, as head of the statistics and research department of the Industrial Relations Division.

Personnel Books

EDITED BY DOUGLAS FRYER

Some contributions of pure science to the study of educational and personnel problems are included in this issue. Books like those reviewed by Kimball Young and Mark May bear upon practical personnel administration. "Briefer Mention" includes facts from more of these books. The field of personnel activities is exceedingly broad in scope, as may be seen in the literature today. Perhaps psychology, economics, and sociology make the major scientific contributions. There is a "give and take" between practical investigations and research undertakings in personnel problems of education and industry, in this country and elsewhere. This wide field of interest is indicated by "Personnel Books" in this issue. The next issue, in December, will review books in a narrower field of vocational guidance. "New Books" in this issue includes books published during the months of June and July.

FRANKENSTEIN NO LONGER A DESTROYER

ROBOTS OR MEN? A FRENCH WORKMAN'S EXPERIENCE IN AMERICAN INDUSTRY. BY H. Dubreuil. (Trans. by Frances and Mason Merrill.) New York: Harper, 1930, xi + 248 pp., \$3.00

Reviewed by MARGARET G. MYERS, *Columbia University*

Europe is beginning to look with intelligent envy upon the methods by which American productive efficiency is attained. In France, Germany, England, Russia, under the names of "rationalization" or "Five-year Plan," the problem of increasing production by mechanizing industry is being vigorously approached—so vigorously indeed that it is causing alarm in conservative circles. The workers are told by these alarmists that American methods of production will be found far more exhausting and monotonous than European, that the worker will be reduced to a mere automaton, the slave of the machine he tends, and that the increased production of goods will not compensate him for the loss of the creative

joy which accompanies the old handicraft methods now largely in use.

It was to test the truth of these sayings that M. Dubreuil started out on a tour of American factories. He was far better equipped for accurate observation than most of the European visitors who have committed to writing their impressions of America. All of his life had been spent as a mechanic in various types of machine shops in France, and nearly ten years in trade union activity, culminating in the secretaryship of the French Federation of Labor. With this experience and a knowledge of English as a background, he came to America, and for fifteen months actually worked in one factory after another.

The answer to the question which he had set out to solve was definitely in the negative. He found that American workers are not Robots, and are not likely to become Robots. It is true that the era of the machine requires less purely manual dexterity in many cases, but at the same time it demands a higher degree of technical knowledge. The "rule of thumb" has had to give way before trigonometrical tables and mathematical calculations. Instead of a surplus of skilled labor reduced to routine jobs by the adoption of machinery, there is an actual shortage of trained workers in many lines, so that factory superintendents are obliged to conduct classes in order to train the men they need.

The intensity of work demanded by machine production is often cited as its most objectionable feature. M. Dubreuil found to his surprise that American workers insist upon saving themselves work wherever possible. They wear gloves upon their hands; they drag heavy pieces of material on little carts instead of carrying them; they have specially constructed trucks to deliver heavy metal at the height of their benches in order to save lifting. All of these operations would be carried on by manual labor in the average European shop. Even the famous assembly line at the Ford plant, the highest development of machine production, was found to be not at all terrifying to the man who actually worked on it.

In this connection the author suggests that it is extremely hard for an outsider with no industrial experience to evaluate such conditions. He cites several cases in which, even to him, a process appeared unusually difficult or unpleasant while he watched another perform it, but became simple and interesting when he set to work upon it himself. And he is certain that many of the old handicraft methods extolled by leisure-class enthusiasts were as difficult and dangerous as the newer industrial processes performed by machines which look and sound like terrifying monsters to the uninitiate.

Relations between employer and worker in the United States are more democratic than in France. The willingness of foremen to accept suggestions from workers seemed to him amazing, and the corresponding attitude of coöperation on the part of employees could not be matched abroad, where more rigid class distinctions prevented cordiality. The better social position of the American worker was matched by his higher standard of living. In an interesting table, the author works out the labor time cost of different articles in a workingman's budget, and concludes that the American gains largely by the increased efficiency of machine production. His conclusion is that the French worker has more to gain than to lose by the introduction of modern methods.

JOB ANALYSIS OF PERSONNEL WORKERS

A PERSONNEL STUDY OF DEANS OF GIRLS IN HIGH SCHOOLS. By Sarah M. Sturtevant and Ruth Strang. New York: T. C., Columbia Univ. (Cont. to Educ.), 1929, 150 pp.

Reviewed by KARL M. COWDERY, *Stanford University*

As indicated in the authors' own foreword this book has been prepared as a companion volume to two previous personnel studies of deans of women in colleges and universities and in teachers colleges and normal schools. The effort has not been to survey all nor to give a representative description of average practices. The "best" practices have been analysed making use of questionnaire re-

ports from the one hundred high school deans of girls carefully selected as representing progressive and constructive thought in this field.

The contents of the book are arranged in five main groups, (1) a chapter on the problem, material and methods of the study; (2) three chapters summarizing the data descriptive of the position of dean of girls

in high schools, the nature and frequency of the position as a distinct job, the background of the one hundred women filling the positions and a discussion of the salary and related factors; (3) three chapters covering the duties, and desirable relationships with the other parts of the high school organization and with the social and industrial life of the community; (4) three loosely related chapters including a case study of the dean's work in one high school, a report of opinions from deans as to the professional satisfactions and problems, and a summary with evaluation of the findings of the study; and (5) a final chapter which serves as a sort of control to indicate the relation of the "best" practices to more generally existing procedures in an entire state, New York. Three appendices give the list of deans who provided data, the questionnaires used, and a tabulation of duties performed by deans and others.

As a formal job analysis the presentation might be found lacking in some respects. However, the fault would be not with the

authors but with the function which they are studying. The writers, so it seems to the reviewer, have admirably handled material involved in a vocation which has not become a standardized occupational unit and which does not lend itself to the more specific treatment and organization possible for such as nursing or librarianship. In well established occupations the activities have by practice become reasonably well-defined and the training, compensation and allied phases are more or less generally recognized. As a matter of fact, much of the value of this study is its revelation of the lack of uniformity in practice and of common point of view in schools. It lays the foundation for progress in the direction of more prevalent adoption of improved organization, personnel and techniques. The authors are to be commended for having made not the easier comprehensive survey, but the more definitely constructive and critical analysis of the work of deans of girls in high school.

APPREHENDING THE GUILTY

THE PSYCHOLOGICAL METHODS OF WORD-ASSOCIATION AND REACTION-TIME AS TESTS OF DECEPTION. By H. R. Crosland. Univ. Oregon Pub. (Psychol. Series, Vol. I, No. 1), 1929, 104 pp.

Reviewed by MARK A. MAY, *Yale University*

This is a critical study of the word-association method of detecting guilt. The occasion of the study was the repeated requests to the Department of Psychology of the University of Oregon from other departments of the University, especially from the dean's office, to aid in detecting students who had violated some university regulation. The author was persuaded to aid certain students in apprehending a thief by the use of the free association method, even though at the time he was highly skeptical of its value. The success of the first attempt, however, encouraged him to go further and handle other cases. The present report is based on seven cases, five of stealing, one of cheating, and one of forgery. Three others are referred to but are not

reported because the facts were not available when the monograph under consideration was written.

The success of the method is evidenced by the fact that of these seven cases a confession was obtained in all except one. This was the case of forgery. However, the evidence collected against the suspect was such that it would have, in the opinion of the author, brought certain conviction in court. If this case is counted as successful, then so far as the detection of the guilty ones in these seven cases is concerned the method herein outlined has a success of 100 per cent.

The author gives an excellent historical summary of the word-association method. A bibliography of 161 titles is appended.

He shows how optimism has followed the successful experiments and pessimism has followed unsuccessful ones. The pendulum of belief and disbelief in the value of the method as a routine court procedure has swung back and forth ever since the word-association experiment was first suggested by Galton.

An excellent summary of the historic criteria of guilt is given, which are as follows: (a) refusal to take the test, (b) failure to reply to significant stimuli, (c) greatly lengthened reaction-time to the significant stimuli as compared with that to non-significant stimuli, (d) obviously concocted replies or responses, (e) responses indicative of guilty information or guilty knowledge. The first and fifth of these are of course the ones on which greatest dependence has been placed.

The author points out certain fundamental defects and limitations in these criteria which in his own experiments have been remedied by improved techniques and additional criteria. Some of the more important features of the techniques are first, the arrangement of the stimulus words, which are typewritten in quadruplicate so that each of four experimenters may have one copy. The use of a chief experimenter with three assistants is perhaps the most important feature of his technique. The chief experimenter calls the stimulus words and manipulates the stop watch. An important feature here is that two stop watches are used. While the first assistant is recording the time from the first stop watch, the experimenter is pronouncing the second stimulus word and recording the reaction time with the second stop watch. Meanwhile the first stop watch has been made ready for the third stimulus word and so on. The author feels that this is a very important phase of the technique, because it enables the experimenter to fire the stimulus words in rapid succession and prevents the subject from organizing his wits or planning a defense. The second assistant merely notes down the response words which the subject gives. The third assistant is assigned the duty of observing the subject's behavior and noting such features as blushing, trembling, and other manifestations of excitement.

The second important aspect of this study is the number of criteria of guilt developed. Of these criteria there are forty. The author is of the conviction that where this type of experiment has failed, the failure has been due in a certain measure to the lack of a proper number of criteria. He frankly states his indebtedness to Clark-Hull for the suggestion that any group of indicators is better than any single indicator. Space will not permit the full description of these forty criteria. They may be classified, however, under three main heads.

(1) The average reaction-time to different groups of stimuli such as: (a) the 80 semi-non-significant stimuli, (b) the 20 pure significant stimuli, (c) the 19 post-critical stimuli, (d) 61 pure non-significant stimuli, and so on.

(2) Ratios between certain of the above means, as for example, the ratio of (a) to (b) above.

(3) The nature of the response words themselves, such as: (a) information revealing responses, (b) total number of repeat responses, and so on.

(4) Certain criteria based on the behavior of the Subject during the test as recorded by the special observer.

(5) Certain combinations of the above criteria. One combination is achieved by converting all criterion scores into comparable measures by the usual statistical method, summing these in various ways, and computing their sigma distances from the mean of the group of which they are a part. This yields a final grand statistical criterion on which greatest dependence is placed.

One cannot help being impressed with the care with which this work has been done, and especially by the enormous number of calculations that have been made. Almost one quarter of the pages of the entire monograph are covered with figures. Many of these are coefficients of correlation, each requiring considerable time for computation. After going over all of these statistical computations one wonders whether or not the number of cases in each experiment were great enough to justify the labor. In the seven experiments the maximum number of cases in any

one experiment was ten. It is well known that standard deviations, coefficients of correlation, and other statistical constants computed on as few as ten cases are liable to be exceedingly misleading. The author, however, has computed reliability coefficients, probable errors, and other constants showing the limitations of the sample. Yet

in spite of all this there is some doubt as to whether or not in such exceedingly small samples the assumptions on which the formula for probable errors and reliability coefficients are based are in fact fulfilled. Apart from this weakness the work ranks high as a scientific evaluation of this method.

PUBLIC RELATIONS STUDIED

THE NEW PUBLIC SPEAKING. By Richard C. Borden and Alvin C. Busse. New York: Harper, 1930, ix + 155 pp., \$2.50

THE ADVERTISING MAN OF DETROIT. By University of Detroit Bureau of Busi-

ness Research and the Bureau of Research and Education of the Advertising Federation of America, with the co-operation of the Aderaft Club of Detroit. New York: Adv. Fed. of Am., 1930, 77 pp., \$1.50

Reviewed by RICHARD S. UHRBROCK, *Cornell University*

The New Public Speaking contains eight rules for conference speakers. They should be orderly, relevant, purposive, brief, informed, logical, tactful and sincere. Reports are presented showing violations of these principles. The authors reorganize these reports and demonstrate how desired results could be attained. The book is logically written, interesting, and should be mastered by all those called upon to express themselves from the floor at public meetings, or in the conference room.

The Advertising Man of Detroit is a research report. 500 advertising men answered questionnaires concerning their duties, age, experience, education and remuneration. The average man was 33.9 years old. He had been in the work eight years, and was paid about \$6767 annually. He might expect to reach his maximum (slightly under \$10,000) at about age 42. The results are admirably presented in short, well-written chapters, with tables and skillfully drawn charts and graphs.

SOCIAL BEHAVIOR: AT HOME AND ABROAD

INDIVIDUALITY AND SOCIAL RESTRAINT. By George R. Wells. New York: Appleton, 1929, xii + 248 pp., \$2.50

SOCIAL PSYCHOLOGY OF INTERNATIONAL CONDUCT. By George M. Stratton. New York: Appleton, 1929, x + 387 pp., \$3.00

Reviewed by KIMBALL YOUNG, *University of Wisconsin*

The first of these books may be said to deal with social behavior at home, the second abroad. Nearly one-half of Professor Wells' book is a review of general psychology but with the aim to expose the foundations of social behavior of the individual, which is the subject matter of the balance of the book. In the latter half of the volume the author discusses the formation and structure of groups, leadership, group pressures

on the individual, motivation, and the need of rational self-discipline.

"In reality there is no such fact as an individual," but always an individual in a group. Group formation arises out of the very nature of interaction of members of the human species. Society divides itself into emergency and kinship groups and special interest associations. The strain between group and individual standards

is enhanced by the traditional persistence of group norms beyond their social usefulness. Art, religion and even law have in the past been important means of alleviating some of the group stresses on the individual. On the other hand, it should be pointed out that organized religious and political bodies frequently retain their power by repressing the individual's personal desires. The individual may seek surcease from group pressures by indulgence in appetites for drugs or alcohol. Even war, in part, alleviates normal group pressures. The author might have mentioned the whole range of psychopathic reactions as another area of release from social strain.

According to Professor Stratton, nation-making depends upon biological, geographic, economic, and linguistic factors. In addition the author holds that there must be "innate psychic requisites for nationhood," an exceedingly dubious assumption. The delusions of national greatness become so thoroughly ingrained in us all that we cannot imagine our relations to others as any different than what has been customary. The mere spread of international relations does not necessarily make for peace. War is caused by population pressures, commercial rivalry, desire for food and raw materials, and demands for increased territory. Yet the more intangible wishes for power and political glory are tremendously effective as well. Nevertheless, all these desires may become factors in fostering peaceful international relations rather than war.

While the political institution of war is built upon innate pugnacity, it does not follow that war is inevitable. Warfare "is no mere persistence of something inborn but is a product and instrument of governmental art." And if this be accepted, then there is no reason why we cannot alter or abolish war. While the pugnacity may persist, the direction it takes can be changed. In our society of nations we have but to civilize the violent means of international relations. Pugnacity is already

under control within the larger national states. But there must be a re-education among the nations, in tolerance, in knowledge of the causes of international conflict, in modification and control of the acquisitive interests, and in the discipline of the desires for security, and for risk and adventure. This re-education involves the home, the school, the pulpit, the press, and every agency within the nation which makes for sane opinion and belief. Moreover there must be some instrument to do well what war in the past has done so clumsily and at such great costs. Peacetime devices have their place, but further than that we must take the profits out of war itself, both to the militarist and to the profiteer. There must arise a community feeling among the nations so strong as to curb the unruly nation which seeks through war its own aggrandizement. Desires for land, for large populations, for raw materials, for tariff-protected industries which have all fostered war in the past need control in the interests of international amity. We must foster all international political devices and increase the use of science in exposing the causes and cures of international struggles. Thus, in education, science and politics, the author sees the fundamental means of bringing a peaceful order out of the chaos of war which still threatens our civilization.

This is a provocative and stimulating book. The author is a little too inclined at the outset to stress native intellectual differences in nations and too inclined at the close to ignore the force of pugnacious emotions as they are at present organized. With the emotions of fear and anger what they are, it does not seem likely that any organization of society can get on without some provision for their expression. Perhaps Professor Stratton's dream may come true for international conduct, but is there any reason to suppose that violent conflict may not break out in other dimensions of social relations, say between the classes?

PERSONNEL WORK AT THE BOTTOM OF THE LADDER

SOCIAL CONTROL OF THE MENTALLY DEFICIENT. By Stanley P. Davies. New York: Crowell, 1930, xx + 392 pp., \$3.00

Reviewed by CHARLES W. MANZER, *Fredonia State Normal School*

"The nature of mental defect, its possible extent in the United States, the problems to which it gives rise, and the measures whereby it can be brought under social control are treated in this volume." After a historical survey of the treatment of the feeble-minded, the author discusses the changes in attitude toward the mentally deficient necessitated by recent studies of heredity and of environment.

The feeble-minded, in the strict sense of the word, are "those intellectual subnormals who are also socially incompetent." The hereditary transmission of feeble-mindedness is neither so simple, nor so predictable, nor so alarming numerically as was formerly believed. The mentally

deficient probably contribute more than their due proportion to social offenders, not because of any direct relationship between a low intelligence quotient and social misbehavior, but because they come, in large part, from underprivileged homes.

Chapters are devoted to the institution and to the colonies for "boys" and for "girls." Extensive illustrative material is drawn from the colonies for mental defectives in New York State at Rome, Syracuse and Gloversville. Later chapters discuss the challenge of feeble-mindedness to the school, community supervision of feeble-mindedness and the place of the mentally deficient in the social order.

Briefer Mention

TECHNIQUE OF EXECUTIVE CONTROL. By Erwin Haskell Schell. New York: McGraw-Hill, 1930, 167 pp., \$2.00.

The Third Edition of this psychology of management appears with a series of questions designed to aid the reader in analyzing the problems and applying the results to his own situation. Executive tools, such as dignity, unselfishness, receptivity, firmness, cheerfulness, stimulate, stabilize, restrain and lead to conformity and loyalty. Executive duties and the handling of difficulties with subordinates and superiors are discussed.

COÖPERATION AND COMPETITION. AN EXPERIMENTAL STUDY IN MOTIVATION. By Julius B. Maller. T. C., Columbia Univ., *Cont. to Educ.*, No. 384, 1929, x + 176 pp., \$1.75.

A comparison of the motivation effect of group coöperation incentives and individual competition incentives among four hundred school children, in which simple arithmetic

problems were used as the test material. Either incentive was found to increase the speed of work above the level of unmotivated work. The efficiency measured was definitely higher when work was done for self (competition incentive) than when it was done for the group (coöperation incentive).

THE EFFECT OF APPROPRIATENESS OF REWARD AND OF COMPLEX INCENTIVES ON MAZE PERFORMANCE. By M. H. Elliott. *Univ. of Cal. Pub. in Psychol.*, 1929, IV, 91-98, 25 cents.

A study of hunger and thirst drives in rats running a maze, in relation to appropriate rewards of food and water. Different maze performances were found to depend upon the nature of the reward and previous experience with the reward. In addition, the results suggested that proficiency is increased when two drives are present, although only one of these is rewarded.

ATTITUDES AS FACTORS OF SCHOLASTIC SUCCESS. By M. E. Herriott. *Univ. of Illinois Bul.* XXVII, No. 47, 1929, 72 pp.

The following are found to be major factors in scholastic success: (a) previous preparation, (b) intelligence, (c) study habits, (d) evaluative-non-evaluative attitude, (e) persevering-vacillating attitude, (f) self-confident-dependent attitude. High scores in the first five are indicative of success. Low scores in the self-confidence-dependent attitude are indicative of success, which is unexpected. The following factors show little relationship to scholastic success: reading rate, reading comprehension, ambitious-indifferent attitude. This study indicates the importance of both intellectual and non-intellectual factors in scholastic success.

RELATIONSHIPS BETWEEN EXPRESSED PREFERENCES AND CURRICULAR ABILITIES OF NINTH GRADE BOYS. By Oliver Kelleam Garretson. T. C., Columbia Univ., (*Cont. to Educ.* No. 396), 1930, 77 pp., \$1.50.

Scoring keys for technical, commercial, and academic groups are offered for use in connection with a new interest inventory of 328 items, devised by the writer. The inventory and scoring keys are prepared for use in the educational guidance of high school freshmen. The correctness of placement of pupils by the scoring keys is indicated by the following correlation coefficients: .87, .73, .56. The odd-even reliability (Brown formula) of the inventory is represented by the following coefficients: .95, .93, .86. The inventory does not predict educational abilities as indicated by correlations ranging from -.30 to .29. It is recommended for use in the educational guidance of high school pupils in their election of academic, technical, and commercial curricula.

PSYCHOLOGICAL STUDIES OF MOTION PICTURES: II, OBSERVATION AND RECALL AS A FUNCTION OF AGE. By Harold Ellis Jones, assisted by Herbert Conrad and Aaron Horn. *U. of Cal. Pub. in Psychol.*, III, No. 6, pp. 225-243, 1928.

This study of remembrance of motion picture material by a sampling of the population of Vermont, shows that growth is maintained up to the early twenties and that a marked decline occurs at about the age of forty-five. By the age of fifty-five the amount of recalled material is less than that at the age of thirteen.

PSYCHOLOGICAL CONCEPTIONS IN OTHER SCIENCES. By Charles S. Myers. The Herbert Spencer Lecture delivered at Oxford, 1929, 24 pp.

A Herbert Spencer lecture delivered by the British leader of industrial psychology, in which he points out the application of psychological conceptions to natural science, and to the sciences of physics and biology in particular. The psychologist has insisted upon the importance of relativity within his field of study at a time when all natural science depended on the retention of the absolute. "And the question has been lately raised whether matter itself is not for the physicist merely the way in which our minds perceive certain aspects of its structure."

A CURIOUS LIFE. By George Wehner. New York, Liveright, 1929, 402 pp.

An honest autobiography of the mind of a spiritualist "medium," which illustrates various psychological phenomena, such as illusions, hallucinations, dream life, somnambulism, false belief, hypnotic and introversion phenomena. Believing himself from an early age to have the clairvoyant power of penetrating sight, the author commences his history with the statement, "I was born to fulfill prophesy." Throughout childhood there were "real" experiences with elves, pixies, gnomes, sprites, hobgoblins, goblins, and ghosts. "White cloud" guides him and is "seen" throughout life. Trances are learned when a young man, and he begins to transmit messages from departed spirits, which, along with that of the stage, has been his occupation.

OUTLINES OF PSYCHIATRY. By Wm. A. White. Washington: Nervous and Mental Diseases Pub. Co., 1929. 445 pp.
This is the twelfth edition of a book that

has become a classic in its field. It has been considerably revised, with the addition of a number of cuts and photographs. While the appeal is primarily to the specialist in the field, the intelligent layman will find much helpful material. Employers will be greatly aided in the detection of symptoms of mental diseases which must appear from time to time in any organization.

THE DECAY AND THE RESTORATION OF CIVILIZATION (The Philosophy of Civilization, Part I). By Albert Schweitzer (Trans. by C. T. Campion). London: Black, 1930, xv + 105 pp.

The thesis of these Dale lectures delivered at Oxford is that modern civilization is collapsing owing to the lack of an ethical principle behind it. The economic development of our world has meant its spiritual decline. Psychic abnormality sets in with the separation of man from the soil, from his own home, and from nature, all of which has come about through industrialism. The individual of today has lost his freedom, his well-rounded development, and the power of thought owing to the pressure of an impersonal, mechanically organized society. The restoration of civilization can only take place when we regain somehow our reverence for life and our moral willingness to strive for the "perfecting of the human race."

HUMAN NATURE AND ITS REMAKING. (New printing with additions.) By William Ernest Hocking. New Haven: Yale Univ., 1929, xiv + 490 pp.

Those interested in the problems of instinct, of education, and the relation of the individual and society will be grateful for this new printing of the second revised edition of Professor Hocking's work. Along

with the mass of impulses and capacities with which man like other animals is endowed, human nature exhibits a unique tendency to try to make itself over. This effort is expressed in law, religion, morality, education; wherever in fact man sets up standards of what he ought to be. In addition to such general instincts as curiosity, play, pugnacity, and fear, man is possessed of a central motive-force which serves as the nucleus of all these activities and which may be called "the will to power." This disposition constitutes the purpose and drive of the individual, by which he seeks to discover what is good and to shake off evils. It conduces to the re-making of human nature even more than does the pervasive molding influence of society. Unlike the followers of Dewey, Hocking does not believe that socialization and society are the final explanatory concepts in human development; instead he offers an individualistic theory.

ECONOMICS. 2 vol. By Bruce Winton Knight and Nelson Lee Smith. New York: Ronald, 1929, x + 1019 pp., \$4.00 per volume.

This book represents an attempt on the part of two teachers of economics at Dartmouth to give students not only the principles associated with the pecuniary organization of society, but also the relations between such principles and social philosophy in a broader sense. The result is a shift from the usual emphasis upon the distribution of the social income to the problem of allocating productive resources among different possible uses. From this point of view the various aspects of social ethics are seen to be parts of the larger problem of social valuation. Personnel administration is treated as a technique in improving production.

New Books

GUIDANCE

READINGS IN VOCATIONAL LIFE. By H. C. Hill. Boston: Ginn, 1930, 656 pp., \$1.80.

YOU AND YOUR JOB. By J. J. Davis and J. C. Wright. New York: Wiley, 1930, 242 pp., \$2.

MENTAL HEALTH

THE PSYCHOANALYSIS OF THE TOTAL PERSONALITY. By F. Alexander. Tr. by B. Glueck and B. W. Lewin. Washington: Nervous and Mental Disease Pub., 1930, 196 pp., \$3.50.

MANAGEMENT AND ADMINISTRATION

BUSINESS SPEECHES BY BUSINESS MEN. By W. P. Sandford and W. H. Yeager. New York: McGraw, 1930, 747 pp., \$5.

CONTROL OF RETAIL STORE OPERATIONS. By E. A. Godley and A. Kaylin. New York: Ronald, 1930, 479 pp., \$6.

INDUSTRIAL ACCOUNTING FOR EXECUTIVES. By J. R. Bangs, Jr., Boston: Ginn, 1930, 450 pp., \$1.80.

PRINCIPLES OF ENGINEERING ECONOMY. By E. L. Grant. New York: Ronald, 1930, 401 pp., \$3.75.

THE CONTROL OF DISTRIBUTION COSTS AND SALES. By W. B. Castenholz. New York: Harper, 1930, 202 pp., \$3.50.

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Productive occupations for industrial veterans. *American Machinist*, March 20, 1930, vol. 72, p. 473-475.

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RUBINOW, I. M. Modern problem of the care of the aged. *Social Service Review*, June, 1930, vol. 4, p. 169-182.

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An historical summary of the activities of the American Society of Mechanical Engineers and at the same time a summary of engineering development in the U. S.

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Juvenile delinquency: a selected bibliography. *Bulletin of the Russell Sage Foundation Library*, June, 1930, no. 101, p. 1-4.

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COST OF LIVING

Standard of living of employees of Ford Motor Company in Detroit. *Monthly Labor Review*, June, 1930, vol. 30, p. 1209-1252.

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HILL, R. C. Waterfront labor conditions aided by employee representation. *Marine Review*, March, 1930, vol. 60, p. 46-49.

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HURLIN, R. G. (Dept. of Statistics, Russell Sage Foundation). Salaries in family case work in 1929. *Family*, July, 1930, vol. 11, p. 139-148.

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VOCATIONAL GUIDANCE

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WAGES

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WAGES—PAYMENT METHODS

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Principles and details for making time studies that form basis for determining operation standards on which wage-incentive plan can be developed.

Interviewing Industrial Employees

A Source of Foreman Training Material

By JOHN R. RICHARDS, *Pennsylvania State College*

The interviewing of employees here described is one among many repercussions from the Western Electric reports of industrial studies at Hawthorne, published in the February PERSONNEL JOURNAL. Similarities of aim and some differences in method will be noted.

This paper tabulates and evaluates the findings of five interviewers from the Pennsylvania State College who interviewed 243 employees of a Pennsylvania manufacturing company on their attitudes toward the policies of the management. The project is interesting in that it marks the entrance of an outside agency into the plants of a private industrial company. The article deals with the operation and value of the interview method when functioning with the confidence of interviewees.

Likes and dislikes expressed by workers and specific suggestions contributed by them are tabulated, and the reliability of the data is considered.

The paper attempts to show the requirements of an interview study in an industrial plant, the results obtained, and the use of such interviews in diagnosing local plant conditions and worker attitudes. The material gathered is to be used in foreman training courses.

FOR the purpose of supplementing its Foreman Training course, the Department of Engineering Extension of the Pennsylvania State College entered the plants of a large Pennsylvania manufacturing company and interviewed 243 employees to discover their attitudes on policies of management. This plan for securing free expression of worker opinion was first suggested by the experiments of the Western Electric Company, as reported by G. A. Pennock, M. L. Putman, and Elton Mayo in the February 1930 issue of the PERSONNEL JOURNAL. However, since its purpose was quite dif-

ferent, the interview program of the Engineering Extension Department developed into one entirely different from that previously reported.

The interviewers did not enter the plants to test any preconceived theories, nor to evaluate personnel activities, but rather sought only specific worker attitudes, especially worker reactions to immediate supervision. Although the project represents the entrance of an outside institution into the life of an industrial plant, the purpose of the program was not superficial or academic.

INTERVIEWING THE EMPLOYEES

The actual work of interviewing was begun on April 21, 1930 by three men from the staff of the Engineering Extension Department experienced in industrial and personnel work and specifically trained for this project. Plans laid before them called for interviewing 300 workers selected from the 25 departments making up two plants of the company. On April 23, two more trained interviewers from the College were called in to expedite the program. Interviewing continued five days, at the end of which time 243 employees of the company had been met. This number made up 40 per cent of the employees, and is therefore a representative sampling.

Selection was made by the sub-foremen who were asked to choose workers of all types and from all positions. Throughout the whole study the foremen were anxious to cooperate to insure the success of the experiment.

Private rooms were used for the interviews. At one plant it was possible to have the worker who had just been interviewed send in the next man, but at the other plant it was necessary, because of the unfamiliar location of the interviewing rooms, for the interviewer to walk back and forth from the mill with the employees. The latter system was found to be better in establishing rapport with the workmen.

Even though the interviewers were independent of the company, obligated to keep all material anonymous, the task of securing the real opinion of the employees was in many cases a difficult one. This may be better understood when it is recalled that jobs were highly prized at that time, and that workers

were naturally unwilling to jeopardize them in any way. The task of the interviewers became even more difficult when the rumor,—springing probably from the workers' feeling of insecurity,—spread throughout the plant, that the College interviewers were really representatives of the management hired to eliminate all dissatisfied elements in the personnel. On the other hand, the interviewers found many workers who were willing to confide their opinions, and to cooperate in what they rightly believed to be an educational project; in addition some seemed not to care if they were endangering their status with the company.

At the beginning of each interview an attempt was made in all cases to make clear the true purpose of the inquiry and to secure full cooperation and confidence. The first purpose of the study was to secure the viewpoint of the workers on plant operation and policies for inclusion in a future foreman training program. This was to be done by collecting and tabulating employee suggestions and attitudes or opinions reflecting attitudes, likes and dislikes. Especially were specific instances sought, tales of actual plant happenings which could later be presented to the foremen in conference in such a way that each foreman might recall a similar instance—"Why that same thing happened in my own department not so long ago!" Since such was the purpose of the study, no questionnaire form was used. Rather, the men were encouraged to speak about whatever they wished to. *What was thought most important by the worker was considered to be the important finding in the interview.*

TABLE 1

Tabulation of grievances and favorable remarks

(Grievances are listed on upper, favorable remarks on lower lines)

GROUPS	INTERVIEWERS					TOTALS
	I	II	III	IV	V	
I. Safety.....	7	18	11	11	4	51
	3	0	8	21	8	40
II. Speed of work.....	3	4	14	9	8	38
	1	0	1	1	0	3
III. Bonus.....	1	1	2	0	5	9
	0	0	0	0	0	0
IV. Wages:						
(a) Rate.....	9	12	3	15	4	43
	3	1	0	9	1	14
(b) Distribution.....	2	4	1	4	3	14
	0	0	0	0	0	0
V. Hours of work.....	7	25	3	4	2	41
	3	0	0	1	0	4
VI. Steadiness of employment.....	1	3	4	1	4	13
	1	0	2	3	0	6
VII. Transfers and promotions.....	3	8	3	0	4	18
	1	1	4	0	0	6
VIII. Supervision:						
(a) Fairness and impartiality.....	4	5	0	1	5	15
	1	7	5	14	2	29
(b) Efficiency.....	4	5	1	3	3	16
	0	0	4	2	4	10
(c) General nature.....	9	12	5	13	6	45
	9	7	14	15	11	56
IX. Environment:						
(a) Associates.....	3	4	8	4	5	24
	0	1	1	1	2	5
(b) Women in plant.....	0	0	7	2	3	12
	0	0	2	0	0	2
(c) Light, heat, ventilation.....	13	6	10	11	1	41
	6	0	0	3	0	9

TABLE 1—*Concluded*

GROUPS	INTERVIEWERS					TOTALS
	I	II	III	IV	V	
(d) Cleanliness.....	2 0	3 0	8 1	7 0	0 0	20 1
X. Personnel and welfare activities	3 5	4 0	4 3	0 7	6 2	17 17
XI. General plant procedure.....	9 1	12 0	10 6	5 0	13 4	49 11
XII. Materials.....	0 0	3 0	5 0	6 0	2 0	16 0
XIII. Equipment.....	4 0	7 0	6 1	14 2	1 0	32 3
XIV. Attitude toward job.....	6 9	10 4	3 1	1 0	3 3	23 17

Tabulation of data since, however, shows that the workers were sometimes encouraged to speak along special lines. This leading was done for the purpose of developing especially important subjects in the foreman training course, or to stimulate a lagging interview.

The interview program proceeded almost exactly as planned, and caused no disturbance. The Personnel Director has since stated that the interviewing "has not caused a ripple in the operation of the plants." Another company official predicted that the men would be anxious to cooperate in the next inquiry since their confidence has now been gained.

TABULATION OF RESULTS

The findings of the interviewers have been tabulated under fourteen general heads. (See table 1.) Under these divisions, the number of grievances is listed on an upper line, favorable re-

marks on a lower line, and the whole is divided vertically to show the findings of the separate interviewers, numbered as I, II, III, IV, V. The interviewers II, III, and IV are the three who worked five days and tabulated 53, 66, and 57 interviews respectively; I and V represent the two interviewers who worked but three days and who met 31 and 36 workmen respectively.

A first glance shows little agreement between the findings of the separate interviewers. For instance, on safety we find:

Interviewer's number.....	I	II	III	IV	V
Grievances.....	7	18	11	11	4
Favorable remarks.....	3	0	8	21	8

This seeming lack of consistency can be laid to either one of two factors involved or to both. In the first place, it may be that the interviewing was

faulty, that the real opinions of the workers were not consistently drawn out, that at times the beliefs of the interviewer were put in the mouths of the interviewees through leading questions and attitudes. In the second place, inconsistency may be due to the fact that the interviewers worked in different plants and departments. The writer thinks both to be contributing causes, but that the latter is the more weighty one, since, when the distorting effects that can be attributed to it are removed by interpreting the data with its source in mind, a fair degree of validity is achieved. Although it is impossible to trace back each grievance to the specific department in which it originated, still it is possible to consider the general departments in which each interviewer worked.

With this in mind, consider again the tabulation under safety. The two interviewers (I and II) who show the greatest proportion of grievances over favorable remarks in regard to safety, are the two who worked most of the time in Plant B. The other three interviewers worked in Plant A, which is older than B, better developed in safety equipment, and performing less hazardous work. The figures seem to show that the question of safety was usually on the minds of men in the more dangerous plant.

The interviewers agree that grievances but not favorable opinions, are expressed freely by workmen. The latter are usually brought out by leading questions. This influence can be seen quite clearly under the sub-division Supervision—Fairness and Impartiality, (VIII a), where Interviewer IV many times led the interviewees to give an opinion. Also under Environ-

ment—Light, Heat, and Ventilation (IX c), where Interviewers I and IV thought this subject important and frequently led into it. Since many of the favorable remarks are not spontaneous, it seems best to disregard them. Free expression of grievances exhibits best the attitudes of plant employees.

To facilitate comparison between the separate findings, the number of grievances found by each interviewer has been adjusted below to the total number of workers interviewed by each. To do this the number of grievances found by the interviewer with the highest number of interviews was used as a constant.

Attitudes on safety

	PLANT B		PLANT A		
	I	II	III	IV	V
Interviewer's number....	—	—	—	—	—
Grievances.....	14.9	22.5	11	12.5	7.4

Here the two interviewers (I and II) who worked in the more dangerous plant show a greater proportion of grievances. The variation still obviously present may be due to differences in the separate departments worked by each interviewer. These differences are often as great as those between the two plants.

The reliability is thus made more evident and plausible by considering the various factors involved, as is further shown in the division on Speed of Work (II):

Attitudes on speed of work

	PLANT B		PLANT A		
	I	II	III	IV	V
Interviewer's number....	—	—	—	—	—
Grievances.....	6.4	5	14	10.3	14.7

A definite grievance against speed of work is shown in Plant A, (represented by figures of Interviewers III, IV, V) while there is much less indication of this dissatisfaction in Plant B. This grievance can be attributed to the high speed of work forced by a bonus system not used in Plant B.

Attitudes on wage rate

Interviewer's number....	I	II	III	IV	V
Grievances.....	19.5	15	3	17.1	7.4

Statements in regard to wages indicate a marked grievance against wages in Plant B (Interviewers I and II), which is the newer plant where the men are more unstable and where wages are lower and lay-offs more frequent. The disparity shown in the tabulation under Interviewer IV results from leading questions asked by this interviewer since his number of favorable expressions is equally disproportionate. Only by looking at the tabulation with the source of each item in mind, can consistency be seen. We conclude that the results of interviews such as these cannot be properly understood if they are merely thrown together. However a rough tabulation of the entire data may be interesting:

	TOTAL EXPRESSIONS	GRIEVANCES	PERCENTAGE OF GRIEVANCES TO TOTAL
A. Environment and working conditions..	114	97	85
B. Compensation.....	104	83	80
C. Conditions of job.....	282	211	75
D. General plant procedure.....	108	78	72
E. Supervision.....	171	76	44

The findings of the interviewers relevant to the purpose of the study may prove more interesting than the preceding consideration of grievances and favorable remarks. Though the reliability of the interview method cannot be proved from the data obtained, yet a lack of agreement among interviewers is no evidence against the truth of the material gained relevant to the primary purpose of this project. The suggestions and descriptions of happenings in the plant confided to the interviewers by many of the workmen are their true opinions, springing from

TABLE 2
Tabulation of suggestions

Improvements in Safety.....	30
Improvements in Working Conditions..	13
Improvements in Equipment.....	11
Elimination of Waste.....	8
Ways to Stimulate Suggestions.....	5
Improvements in Training Procedure....	5
Improvements in Bonus System.....	4
Methods to Increase Speed of Work....	3
Improvements in Supervision.....	2
Better Distribution of Wages.....	2
Improvements in Shift System.....	2
Methods to Increase Quality of Product.	2
Improvements in Repairing.....	1

minds anxious to confide. Such confidence is not usually granted to management. But under the conditions of this study, where the workers believed the College to be conducting an educational inquiry, the requisite confidence was built.

WORKERS' SUGGESTIONS

Among the findings of the interviewers were a number of definite suggestions offered by the workers. These have been tabulated in table 2. The total of 88 different suggestions represents a group of definite remedies pro-

posed by workers having specific machines, equipment, and conditions in mind.

Preponderant in number are the suggestions for improved safety, totalling 30. These include suggestions for improvements in machines and their operations, position of equipment, removal of waste and junk, storage, practices of fellow workers. Actual statements of two workmen may illustrate the form of the safety suggestions:

"That belt is on the wrong side of the aisle from the safety standpoint. If it breaks it endangers 15 machine operators. It has hit men on the head before, and now the fact that it is above them makes them uneasy. It could be moved to the other side."

"In my department the men work back to back. I sit so close to the next man that it would be impossible for me to escape if the machine, which whirls very fast, happens to break. I can't work well when I feel I'm caught in a trap. If they made more room or put in seats that slide to the side, it would be better."

There are 13 suggestions concerning environment and working conditions. These deal with ways of bettering ventilation by hoods, drafts, and fans, more efficient heating, and improved cleanliness.

Eleven suggestions come under improvements in equipment, including improved machines, replacement of parts, changes in position, rearrangement and changes in plant and its surroundings. Perhaps coming under this same heading are suggestions on waste elimination, which deal with savings in materials, fuel, method of operation, powering, placement of personnel.

"Now when the material has been worked on all through the mill and finally goes

through our machine, it is inspected and often sent back because of some flaw in the material before it went through the machines at all. The company could save a lot, and the men would be more satisfied, if the material had been rejected before any work was done on it. The men who work on such stuff get disgusted with everything in general."

"One foreman makes us do two operations at the same time. This causes a lot of scrap and poor quality. Our other foreman tells us to be careful and we make much less scrap that way and yet get just as much done."

The man just quoted, working as he does under two foremen, is in a position to judge relative values. Consequently, his observations and conclusions are important. Workers know of many improvements, since they work day in and day out in the same position, becoming ever more acquainted with its details, and finally developing such an accurate observation of their one job that no cursory survey by an engineer or efficiency expert can approach it. Moreover, the evils that workers alone are acquainted with are those most in need of elimination, since those known to management are already well on the road to correction. Yet the workers do not ordinarily feel it their place to contribute their findings. This attitude of the employee is, of course, a real and unnecessary loss to the management.

WHAT IS ON THE WORKER'S MIND

A study such as this is extremely effective in securing the workers' reactions to local conditions—specific systems, specific overseers and specific policies. Each individual plant, in fact each department, has individual conditions affecting the workers in different ways.

What is the effect of these conditions? Does the danger in this department affect the speed of work? Does this bonus system really set up incentives? Can this job be made more efficient? How should the foreman handle this case? Answers have come out in the interview program. The beliefs most pressing and most important in the worker's mind can be determined by fair and impersonal interviewing.

The more important expressions of worker philosophy found in this study have been tabulated. These specific instances relate directly to conditions present in the plants of this one company, local systems of beliefs on the minds of the workers. They do not admit of a rigid classification, but have been grouped under these heads:

- I. Speed and requirements of the job in relation to rate of wages, safety, and quality
- II. Bonus system
- III. Supervision
- IV. Plant equipment and operation
- V. Women in the plant
- VI. General plant procedure and policy
- VII. Happenings in plant
- VIII. Miscellaneous

Type one under the first heading—"There is a lack of incentive to improve work, since increased efficiency brings no return," drew quite a number of expressions, some of which are quoted:

"This efficiency racket is unsatisfactory—a man doesn't get any return if he produces in six hours what it usually takes eight to do. Most men entering the factory lose all interest in their work—all they want to do is collect their pay. When a man shows an interest he should be encouraged more."

"These machines make it possible for one shift to do the work of two—and besides

that the men have to work faster than formerly—yet that doesn't do us any good."

"There is a limit to wages in this department that is very low. When you get that, no matter how much better your work gets, you can get no more money."

"Seven years ago my task was five or six thousand—now it is 9500—yet I get nothing more."

"Why should the workers help to increase production? They won't get nothing, only be laid off."

The bonus system is a sore spot with the workers in one of the plants studied. Many pertinent observations were recorded concerning it:

"I was working on a jig that called for the careful drilling of holes. Working on this, a man's mind must be free to do a good job. A time limit has a bad psychological effect."

"This bonus war of everyone against everyone else is bad. It makes men neglect their tools and their skill, they just work ahead, and never stop to fix anything."

"The fellows get together and set a rate at which they will work—102 per cent. If we go above that we get nothing and probably will have our rate raised."

Many of these specific instances are characteristic of internal conditions of only this one company, the same states of mind would not be present in all plants:

"The men here often read of the huge profits of this company—results of their work. How are they repaid? They are not, and therefore they all laugh at waste elimination, at suggestion boxes and the plant newspaper, at everything the company suggests."

"We aren't allowed to smoke here because once a man fell asleep and burned himself. But then they carry big torches around the plant. Isn't that more dangerous than a cigarette? The foremen and office men all smoke—why can't we?"

A grievance often met by the interviewers concerned the lack of credit to the worker for improvements effected, resulting in the keeping of all ideas and new processes secret from the management:

"One of the men in the plants developed a process which increased production five times. The foreman noticed it and told the bonus man that the idea was his own, to raise the task—from 12 to 60. I heard that man say: 'No matter what ideas I get—I'll keep 'em to myself.'"

An especially important finding of the interviewers is the tabulation of the reaction of workers to immediate supervision. The cases gathered are later to be classified under the various headings of the foreman training course: Coöperation, Discipline, Disturbing Types, Training, Leadership, etc.

"The foreman said to go ahead and do the best you can. When the job was finished 90 pieces had to be scrapped. Some men were punished for this and all of us were ready to quit—the bosses didn't know what they were doing."

"When my foreman reprimanded me for leaving the machine, I just walked out. But he is a good man, he found out I was right, and then he came after me to return."

"Our new foreman gets 25 per cent more work from us by leading instead of driving like the old one."

"The girls get nervous when he shouts at them, and can't work right for hours."

"The men deliberately waste material to get even with the foreman."

"The good-natured foremen are the ones we work for—when they are around we work and when they are away we work. The foremen we don't like we work for when they're around, but when they leave we say 'He's gone away. Let's loaf until he gets back.'"

An especially interesting comment often volunteered by the workers was that they felt better after talking about their grievances. Often these grievances were real, the trend of the inter-

view focussing again and again on the one sore spot.

SUMMARY

Five College interviewers interviewed 243 employees, using the method of free conversation, rather than the questionnaire method. It is believed that the workers in most cases confided their true beliefs and opinions to the interviewers. These expressions of opinion have been tabulated under fourteen general heads, as grievances or as favorable remarks.

Little agreement is shown in the findings of the various interviewers until these findings are traced back to their origin in specific plants and departments. A composite tabulation of all the statements obtained is worth little; but the cause for this may be the normal diversity of conditions between and within plants.

The important findings of this study are in the words of the individual interviews. Here is a great wealth of suggestions and specific instances testifying to the worth of the interview method of study. The suggestions concern improvements known only to persons thoroughly experienced in specific processes. The states of mind discovered to exist in workers through their freely offered opinions are in many cases reactions different from those known and expected by the management.

We conclude that it is possible to secure by this interview method a knowledge of what is on the worker's mind and an ability to predict his reactions to specific plant conditions. This will be further realized when the findings of these interviewers are later presented anonymously to the foremen in the plants studied.

A Monotonous Job in an Emotional Crisis

By REX B. HERSEY, *University of Pennsylvania*

Professor Hersey has previously given to PERSONNEL JOURNAL readers intriguing glimpses of his studies in industrial psychology, notably in the articles on "Rests—Authorized and Unauthorized," published in June, 1925, and "Periodic Emotional Changes in Male Workers," in April, 1929.

Factors determining the mental attitude of any person toward his life and work are often difficult to trace. This article, nevertheless, attempts to portray, through the intensive study of an individual worker, how the nature of a man's job and his cyclical variations in mood color to a large extent his attitude toward a serious problem of readjustment. The case portrayed, though not a usual one brings into high relief the bearing emotional processes and the nature of the job may have in the life of a worker. The study of an extreme case such as this helps in understanding those emotional reactions which less obviously but just as truly characterize the relations of normal men to their work.

THE study upon which this article is based resulted from the desire of a large public utility corporation in the east to learn more about the factors which influence the mental and emotional attitudes of its workers. The writer was invited, under the auspices of the Department of Industrial Research of the University of Pennsylvania, to make a year's study of a group of normal male workers of various occupations, ages, personality types and nationalities. They were studied carefully in regard to (1) overt behavior, such as efficiency, lateness, cooperativeness, verbal outbursts, constructive ideas, absentism, etc.; (2) inner emotional behavior; (3) dominant trends in thought and reverie; and (4) such physical and physiological

items as could be either detected or measured readily in the plant, such as blood pressure, colloid content of the blood, weight, hours of sleep, illnesses or pains, and feelings of fatigue. All of these men had full knowledge of the study and cooperated willingly in describing and analyzing their emotional and objective behavior.

The wide awake modern employer realizes quite clearly that the mental attitudes of his employees are of very great importance to the successful and profitable conduct of his business. He is however, still handicapped by a lack of reliable information about the emotions of men at work.

One of the most interesting facts about man's emotional life, which has emerged from the analysis of the

material collected, is that man's personality traits and emotional attitudes show a cyclical variation which cannot be explained as a result of external or obvious reasons but which seems to be characteristic of the individual. Seventeen cases were included in the first study and since that time, eight additional ones have been added. The same cyclical variation has manifest itself in every case studied. The average cycle for all the cases is between five and six weeks, though two cases usually showed three week's cycles and one a nine week's cycle. The importance of a realization of this fact is evident not only in the field of industry but also in our social and home relationships.

It is the purpose of this article, then, to present for consideration and analysis a rather interesting case history, which will give an idea of how the emotional cycle operates in a person's life. At the same time it will show the important part played by the type of work a man is doing in the proper functioning of his life. We shall designate this worker by the name of Worker S.

At the time my study opened Worker S was a very skilled and efficient craftsman. Most of his work was in the open and since he was efficient and was working on piece work, his earnings were very high. In addition, he really enjoyed his work; even in the rain he could often be heard singing lustily as he worked away under a car. As he said, "I usually get up feeling fine in the morning and feel that way all day unless the work goes bad or I have an argument." This happy state of affairs was soon broken up by a regrettable accident

which so mangled Worker S's left arm that it had to be amputated. To make the situation even worse, Worker S had very shortly before become engaged. His fiancée spent practically all the time with him at the hospital until he was well enough to go home. Her sweetness and good cheer made it difficult for Worker S, at first, to realize the seriousness of the blow which had befallen him. His foreman went to see him in the hospital and told him not to worry, that he would arrange some sort of job for him when he was able to return to work. It is such interest and appreciation of their workers' difficulties which make men admire and like to work for certain foremen, while they despise others for their lack of consideration.

As soon as possible, Worker S returned to the shop where the foreman gave him the job of looking after the tools. It was the only work which could be devised for him but, as we shall see, it possessed many drawbacks for a man passing through such a serious readjustment. In the first place, it was too obviously a gift. Worker S felt that he was not earning the wages paid him. Before he was hurt, one of the other men had spent a few minutes in the tool-room the first thing in the morning and then again in the afternoon. Worker S could not help realizing that there was no real need for a full-time man in that position. In the second place, he had too much opportunity to think, which, in his case, meant brooding over his troubles. In this respect his work is comparable to that performed by many workers at repetitive tasks which require little thought or skill. As such its influence

on the process of Worker S's readjustment is of very great interest.

Worker S's problem, however, was further complicated by another crisis, that of the relationship between his fiancée and himself. Like many girls of the present generation, she had been brought up with the idea that she should have certain comforts and even luxuries. Had Worker S been able to continue with his old job, it is likely that his income was sufficiently near her standards for them to have married. His accident did not cause her to change her ideas of what she should have after they were married. Worker S saw no possible way of gratifying them. Marriage with her, instead of being a goal toward which he could plan and strive, became a source of apprehension and dismay. Worker S is then confronted by three crises; the loss of his arm, the nature of his job, and his relationship with his fiancée. Though the inaugurating crises sprang from the loss of his arm, let us consider them all as being of equal value.

Our daily study of Worker S began on November 7th shortly after he had returned to the shop. Monday and Tuesday of that week he was relatively cheerful "due largely to the inspiration of having seen my girl Sunday." On Wednesday he came in a bit lower emotionally and about 10 a.m. was pulled down to acute pessimism in which state he remained the rest of the day. One of his fellow workers had said to him, "Aw, isn't it a pity for a young man like you to lose an arm." On Thursday and Friday he was much better, but on Saturday presented a complete picture of pessimism and disgust saying, "Today my situation is clearly

before me in its worst light. Even the anticipation of seeing my girl this afternoon doesn't help, though that usually makes me happy."

The following Monday (second week) he was no better. He said, "Today I could not stay in that place (the tool-room) fifteen minutes. I don't know what is the trouble. God, it's enough to kill you doing nothing all day." On Tuesday Worker S was not quite so low because he had a lot of opportunity to talk with a fellow worker and keep his mind from dwelling too much on his troubles. Wednesday, however, saw him drop back to the same low state of Saturday and Monday. He was debating as to whether or not he should give up his girl. He claimed, "She is a spend-thrift and has no idea of the value of money, but at the same time I must admit that she sure is fine and has done a lot for me." This is the first occasion when we notice the actual problem of breaking with his fiancée definitely in his mind. It would seem that Worker S had been in a very, very pessimistic frame of mind ever since Saturday and it is probable that his eyes were more keenly observant of her faults than usual when he was with her Saturday afternoon and Sunday. By Friday Worker S's pessimistic mood seemed to have lifted. He said, "Today was a good day. It is not a question of what day in the week it is that makes me feel good or bad. It is when I get to thinking or when somebody recalls my condition, or what I used to do. If I have a heap to do, or if I have plenty of people to talk to who don't recall my arm, I get through the day pretty well. If any of them things happen,

my life is hell until something happens to change me."

There is no doubt but that Worker S was largely correct in his analysis of the causes of his deepest depression, but he did not go far enough, for we have just been able to see that he passed through practically a week of very deep depression with no particular reason to account for it. It is true that on Wednesday of the week previous a fellow worker had mentioned the loss of his arm and that this had made him depressed the rest of the day, but on Thursday and Friday he showed no effect and it was not until Saturday that his very blue mood started, on a day when, ordinarily, we find him to be most cheerful.

The next week (third week) showed him to be fairly high all week in spite of an argument with his girl which occurred during the week. On Wednesday he remarked, "These three days of this week passed quickly. I don't believe I looked at my watch once . . . it is the same thing every day. If I can keep from thinking, I am all right; as it is, I am usually up and down. One minute I am happy talking with the fellows, the next, I may be in the dumps."

Monday of the fourth week showed him still on the happy side. He said, "My life may not be so bad, after all." On Tuesday he received a disappointing letter from his girl which depressed him, but only temporarily. The rest of the week, while his emotional state was both up and down, showed him, on the whole, to have a fairly good emotional resistance to the difficulties of his life, though it is quite clear that he had more cause for being blue, due to

his girl's attitude, than he had during the period from Saturday of the first week to Friday of the second week.

The following week (fifth week) was on the whole, an unusually happy week due to a combination of high emotional resistance and two external events. The argument he had been having with his girl was very satisfactorily settled over the week-end, and he was paid as a mechanic instead of as a helper as his boss had intimated might be necessary. He had almost no worries on his mind all week until Friday when he began to wonder why the firm which was making his artificial arm had not written him. He said, "Naturally, I am somewhat up in the air as I am laying great store on the arm and what I can do with it. I will call them up tonight." All day Saturday he was happy and excited because that night he was going to have his new arm fitted on.

On Monday, December 12, (sixth week) he came to work in a very pessimistic mood due, so he said, to the fact that his arm did not work as he had thought, and it also brought up the thought of his trouble and what he was before. On Tuesday an added worry struck him when a letter came from his girl stating that she wanted to come up after Christmas and start her trousseau. In spite of all these troubles his emotional state had risen considerably by Wednesday while by Thursday his pessimism had completely vanished, and he was laughing, talking and joking. Here we notice that in spite of Worker S's very real problems at this time, he was able to throw them off quite rapidly.

Though brief periods of temporary

depression were evident now and again we notice no persistent depression until Thursday of the seventh week. On Friday he had very little to say, remarking on one occasion, "The world would be different if hope were there;" on another occasion, "I am an example of what not to be." On Saturday, he said, "I feel like getting drunk and staying that way; I am way down."

Sunday and Monday, December 25 and 26, (eighth week) were holidays and I did not get to see him until the Tuesday following when he was still pessimistic. Wednesday showed him in a slightly better frame of mind but, as he expressed it, "Peevish and up in the air because H (one of the gang leaders) came in and implied it was my fault that the tools were not there for the men; and then I am still mulling over what my girl said Monday about my making good." By Thursday he was "as good as usual." This period of depression just discussed would seem to be a low period induced, primarily, by internal physiological or physiochemical factors rather than external events. We find that it is roughly five and one-half weeks from the end of the last persistent low to the close of the present one, and from our analysis of the other men studied, we should expect Worker S to show similar cycles in the future, with a length varying from four and one-half to six and one-half weeks, provided that the five and one-half weeks' period can be taken as the norm for Worker S. The next low did occur during the fourteenth week making a six and one-half weeks' cycle.

During the sixteenth week he was unusually cheerful in which state he

remained until Saturday of the eighteenth week, though he did have a couple of very low days during the seventeenth week because of another argument with his girl. His next protracted low states, without obvious reason, occurred during the nineteenth and twenty-fourth weeks, making two cycles of exactly five weeks each. On Wednesday of the twenty-fourth week he said, "I can honestly see no reason for my feeling like hell this way except I am tired of carrying this thing (his artificial arm) around with me. I have been trying to fool myself and be happy but it is no use. Life is too long. I don't want to talk to anyone or be bothered. At home I don't say a thing to any of them, but go right up to my room. I have hardly spoken to my father for a week. My girl is not the cause for there is no change between me and her."

My routine study of Worker S closed after the twenty-seventh week, but since that time I have kept in fairly close contact with him. He presents to our analysis a mixed and complex picture. In endeavoring to assist in his readjustment, where should one begin? It was certainly impossible to do more toward restoring his arm than had already been done. The conflict between himself and his girl brooked no direct interference. The most obvious way of assisting him was a change in the conditions of his work. Not only was it distasteful to his ego in that it made him feel he was the object of charity, but it also seldom gave him enough to do to occupy his mind. In this respect it resembled work of a purely repetitive nature, requiring no varied physical activity or conscious

mental effort, examples of which may be found in such jobs as spinning, certain types of drill press and cutting work in the metal trades, certain forms of machine tending and, in some cases, modern household duties. Unless the mentality of the worker is too far above his job or his physical energy too low for him to do the work and yet find satisfaction in outside activities, such work does not seem to show harmful *emotional* results unless the worker is faced with a serious crisis as was Worker S. We have clearly been able to see how his reveries, while he was at his undemanding work, tended often to reinforce the difficult and helpless phases of his situation until life seemed so unbearable that he wished he could escape it all by fleeing to the West as a hobo, or even through death.

On talking over the situation with Worker S's foreman, I found that he readily agreed with this analysis and that he already had in mind a change in the nature of Worker S's work. The new work which he proposed was to put Worker S in charge of the collecting and sorting of the scrap for the entire shop. This new work required a good bit of physical activity and offered Worker S a variety of minor problems to solve. It was, at the same time, mostly out of doors, a fact that appealed to Worker S very greatly as he enjoyed being in the open air and had always worked there previous to his accident. A certain amount of authority and responsibility was likewise involved as Worker S had under him three or four day-laborers who collected the scrap. Worker S also now felt that he was really earning his money and was no longer being carried by the boss as an object of charity.

Some three or four weeks after Worker S had been put on this new job, I noticed on seeing and talking with him that his interest in life seemed greatly increased, and his general attitude toward the loss of his arm was much improved. Some four weeks later still he informed me that he had at last definitely broken with his girl. Now it is quite true that we cannot be absolutely sure that the change in the nature of S's work was the most important item in bringing all these other consequences in its wake. Subtle processes of healing and of increased vigor and determination may also have been at work, yet the fact that improvement took place so quickly after the change in jobs seems to make it incontrovertible that the most important single factor was the change in the nature and psychological implications involved in S's work. The alteration in the nature of his work did not do away with his cycle, as my continuing observation of him showed, but it did help to raise it in its entirety.

As a general conclusion, I believe that we are correct in saying that the total plant situation and the physical condition of the workers, the two big factors in their emotional life, are largely in the hands of the employer. He, with the help of the employees, should be able to make his workers' daily tasks ever increasingly satisfactory to them. Two methods of attack seem especially demanded:

1. The selection and training of foremen to handle those under them understandingly and sympathetically, not taking out their own emotional lows—or highs—on their workers.

2. More careful analysis of the mental, emotional and physical tension involved not only in the work itself but also in the total plant situation of the worker.

Worker S remarked to me some two weeks after he had been put on his new job and then some six months later practically the same words. "I'd rather be here in the shop than at home or anywhere else. It sure is not like it used to be since I am out of the tool-room."

I offer this very human story as suggestive of the possible importance of any man's working relations in all the various phases of his life. On my last visit back to the plant, Worker S has had even more duties added to his work and was still better adjusted to life in general, though the advent of a new foreman, who did not seem to have

the same personal interest in him which his old foreman had, was causing him a certain amount of apprehension.

The case of Worker S is not merely an individual picture. It represents the type of situations workers face, whether their source is in the home, the plant or their own physical bodies. In any plant, at any time, some workers or executives are confronted with major crises which lower efficiency, disturb emotional health and upset digestion. The cheering conclusion to be derived is that intelligent sympathy and understanding direction may prove of untold help. Employers' efforts should be directed more and more to educating their foremen and workers to meet such crises and overcome them cooperatively with the least friction and loss of energy.

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The Disagreeable Job

Selecting Workers Who Will Not be Annoyed

BY O. MILTON HALL, *Personnel Research Federation*

Who wants to be a garbage man, working all day in filth and ashes? Thousands of strong, able workers as a matter of fact prefer this occupation to other employments and choose to stick to it year after year. They must be insensitive to annoyances that repel other men. Many kinds of work are characterized by some feature highly disagreeable to most people but not to all: a rank or pungent odor, incessant noise, stickiness of materials handled, cramped quarters, dust, grease, heat, dampness, monotony. To some men the solitude of the cowboy or the forest ranger is unendurable.

Given an occupation like that of laundry marker, with a high labor turnover clearly traceable to some one annoying feature, how can the employment interviewer ascertain in advance which of the otherwise qualified applicants are least susceptible to that particular annoyance, and hence most apt to become stable, satisfied workers?

Mr. Hall has analyzed this question and indicated a way in which the answer may be sought.

The question of disagreeable jobs is analyzed and discussed. Some concerns have a high and costly labor turnover because of the peculiarly annoying or disagreeable character of the work. It is not greatly annoying to some but others are too disturbed to remain long. This paper describes a technique for detecting before employment those applicants who will not be bothered by the disagreeable features of the work. It selects such a feature and finds by statistical means eight other conditions that are highly correlated with it. That is, those who are not annoyed by the first condition also tend to be unannoyed by the eight others, and conversely, those who are greatly annoyed by the first are greatly annoyed by the others. With this point established, applicants can be examined to find out how much they are annoyed by these other conditions. From this a prediction is made as to how much they will be annoyed by the job. Other things being equal, those found to be unannoyed by the job, so disagreeable to other people, will be selected as the safer risks.

THERE are jobs that we term disagreeable,—which means that they are disagreeable to most people. Yet there may be a small minority who do not or would not feel unpleasantness in pursuit of such occupations, and it is these of course who should be doing the work. This paper suggests a method of detecting and selecting such workers, and analyzes the problem.

The best adjusted, most satisfied worker finds some parts of his work unpleasant. This seems inevitable and perhaps desirable. It may stimulate him. A too comfortable chair invites sleep rather than study. However, there are many occupations that are exceedingly disagreeable when the wrong people get into them.

There is the garbage man working all day in filth and ashes, and the scavenger; the laundry worker handling smelly socks and handkerchiefs that are worse; the miner in his narrow, hot seam; the steel worker before his fiery hearth; the fisherman exposed to climatic rigors. Miserable lots, some of us say, but hundreds of thousands do these jobs and like them. However, there are other thousands to whom the work is highly disagreeable. Through financial pressure they may continue at the cost of efficiency and happiness, or turn aside with warped attitudes toward work in general.

We have spent a great deal of time and effort in developing methods of selection for jobs on the basis of aptitude, measuring intelligence, various dexterities, and so forth, but have done less if not thought less concerning selection for temperamental "aptitude." As we once took it for granted that

men finally drift to the occupations for which they have the greatest aptitude, we are still prone to think they will gravitate toward emotionally congenial work. Furthermore, though it is true that aptitude for a particular line of work is in most cases prerequisite to pleasure in work, it does not follow that all work for which we have aptitude will be agreeable. There are few without the ability to become successful laundry markers, but not many of us are without attitudes against dirt and body secretions which would call forth nauseating disgust at the first attempt at the job.

It will be granted that from the point of view of both individual and employer it is expensive to enter an occupation which proves to be exceedingly disagreeable to the individual. There is a need for methods of selecting from otherwise qualified applicants those least susceptible to particular disagreeable features of the job, that is, in occupations where the feature is so prominent and disagreeable as to cause a high and expensive labor turnover. This paper suggests such a method. But first an examination of unpleasantness in work is in order.

When we say that something is disagreeable we mean that experiencing it arouses unpleasant feelings. That is our individual view, based on our own experiences. But when a thing is generally labelled disagreeable it means that a large proportion of the population considers it so. Obviously some conditions are much more likely than others to elicit unpleasant responses, that is, more people experience an unpleasantly toned response to them, and the unpleasantness is greater.

Thus the disagreeable occupation is one that necessitates doing certain things, being stimulated by certain things, that arouse feelings of unpleasantness in a great majority of the people. But note that, strictly speaking, the job itself is not unpleasant—that is in the man. The odor of a stable is a pleasant aroma to some but a vile stink to others. This may seem to be an unnecessarily fine distinction, but it is not, for it means that that job which most of us call disagreeable may be actually pleasant for some few. Naturally, members of that last rare group—if we can find them—should be doing the work, not others.

Now, feeling responses to stimuli are dependent on one of two factors, usually both. The first is hereditary make-up—withering heat is unpleasant to most everyone. Whether or not this is due to an “instinct of self-preservation” we need not inquire. It does seem to have a direct hereditary basis. The other factor is experience. Stimuli, which originally do not evoke unpleasant responses, come to do so by conditioning. For example, the machine that was once a workman’s pride and joy may call forth nothing but fear after it has cut off his hand. It is probable that most aversions are the product of the two factors, sometimes one being more potent, sometimes the other.

Probably no one will challenge the general statement that we should do all in our power to try to select workmen for a disagreeable job who will be temperamentally fitted to that job, that is, those who will not find the “disagreeable” work disagreeable. And no matter how unpleasant the

work, there is reason to think that there are such men. To use a rather grotesque illustration, even the infliction of physical “pain” is “pleasurable” to some few abnormal members of the population! Some device to help detect applicants temperamentally suitable to disagreeable occupations would be of value.

There is no reason to believe that all aversions arise in a haphazard manner. Those that are acquired, not innate or inborn, are really habits, learned ways of responding to stimuli. And they may be parts of habit systems or attitudes. An attitude can be said to be a habit system that may determine the response to any number of situations, some never before experienced. The attitude already having been built up, the response to a new situation perhaps may be predicted. The wider attitude determines the response, which in turn, after repetition, itself comes to be a habit. Of course the attitude, or system of habits, is no mystical entity but is made up of just such individual habits.

Thus a particular worker who believes that he is underpaid, that the company is making a slave of him, who deliberately restricts output and wastes materials, may also be expected to laugh at suggestion boxes, the plant newspaper, and very possibly to consider that the foreman unfairly discriminates against him. We cover all this by saying the worker has an “uncooperative attitude.” Again, the man who believes that Russia should be recognized, that there should be absolute freedom of speech, that the navies of the world should be sunk, and that the church is not altogether a

boon to society, also may be expected, when first confronted with the question, to believe that birth control information should be freely disseminated.¹ Or we may safely wager that the worker who continually fears that a lay-off is coming, and that his rate will be cut, also worries about being cheated out of the foremanship for which he has been working so hard. There is a guiding "mental set," whether or not the company has given him ground for his fears.

It may be said, then, that habits of thought do not all develop haphazardly,—nor do habitual emotional responses. And acquired aversions (based on innate factors in some cases) may be considered to be that.

Upon this principle rests our suggested method of selecting workers who will not be annoyed by specific "disagreeable jobs."

Of course, the things about work which may be disagreeable are legion. We are interested now in specific, overwhelmingly disagreeable features intrinsic to certain occupations. In contrast to this may be mentioned the unpleasantness aroused by trying to do work for which one has no aptitude. Given the right man, that condition will make any sort of work disagreeable.

A SUGGESTED METHOD

To repeat, some occupations have aspects intensely annoying to some people and not to others. So annoy-

ing is the condition to susceptible workers that they are forced to leave. A high and expensive labor turnover is the result. Dried fruit packing is an example. The fruit is sticky to the touch. The packers have their hands constantly sticky. Everything they touch is sticky. To many workers this condition is disagreeable and becomes intolerable. They leave. A very well managed concern in this line of business attributes a great part of its high labor turnover to this condition. In laundries there is an important job with aspects intensely distasteful to many workers. This is the job of sorting, counting, listing and marking the soiled articles of clothing. Nasty handkerchiefs and smelly sox are not nice to handle. The problem is, to find employees who can do this essential work without feeling great annoyance. Plants manufacturing rubber products have a similar problem because of the odor and the sticky qualities of the materials.

Obviously it would be valuable to have some means of detecting before employment those applicants who will not be troubled at all or who will be annoyed to a comparatively mild extent by the disagreeable character of the job. Other things being equal they are better risks than the more susceptible applicants. Of course it is useless to ask the applicants directly whether they are or are not annoyed by the condition in question. They want the job. If the fact of freedom from susceptibility is to be ascertained, it has to be done by indirection.

One way of doing this suggests itself. Perhaps there are constellations

¹ George B. Vetter. Measurement of Social and Political Attitudes and the Related Personality Factors. *J. of Abnormal and Social Psychology*, 1930, vol. xxv, no. 2, pp. 149-189.

or clusters of annoyances. Perhaps the man who is not annoyed by a certain situation is more likely to be unannoyed by certain other specific situations. If such is the case it would be possible, by ascertaining the degree of annoyance caused by these other things, to predict the degree of annoyance which will be caused by the first situation. In other words it would be possible to find out, let us say, how much it bothers a man to handle dirty linen without asking him.

Data were at hand to test this hypothesis in a preliminary way. Cason² had a group of people signify the degree of annoyance caused them by a large number of situations and things. Each item was rated on the following scale:

- 3—Extremely annoying.
- 2—Moderately annoying.
- 1—Slightly annoying.
- 0—Not annoying.
- X—Have not been in the situation.

The writer had at his disposal data for the first 122 complete cases. Selecting the annoyance "To see a person wearing dirty clothes" as a basis, because that was the nearest approach to the laundry situation, the problem was to find which, if any, of the other annoyances had a high positive relationship to it.

A rough index of relationship was felt to be sufficient for the purpose, so the coefficient of association³ was

² Hulsey Cason. *Common Annoyances: A Psychological Study of Every-day Aversions and Irritations. Psychol. Monog.*, 1930, no. 182, 200 pp.

The writer is indebted to Dr. Cason for the use of his data.

³ From the four-fold table, $-Q = \frac{ad - bc}{ad + bc}$.

used, coefficients being calculated between the basic annoyance and each of twenty-three others. Distributions of the twenty-four annoyances were made and dividing lines placed at such points as to give the most equal number of "high" and "low" cases for each annoyance. For example, cases marking the situation "To see a person wearing dirty clothes" as 3 (extremely annoying) were called "high," and all below that (0, 1 or 2) "low." But in the much less generally annoying situation "To have to get up in the morning" all those above 0 were called "high."

The annoyances employed and the coefficients of association between them and the base annoyance, "To see a person wearing dirty clothes," follow:

1. To see an untidy room.....	.73
2. To see the decayed teeth of a person.....	.72
3. To hear a joke or story on a sex subject when in a group of people.....	.69
4. To hear a man swear.....	.67
5. The odor of stale tobacco in the room of a private home.....	.67
6. To see a person picking at a sore.....	.66
7. To see a person wearing shoes that need a shine.....	.64
8. To see a person picking his (or her) teeth.....	.62
9. A person continually criticizing something.....	.57
10. A person being sarcastic.....	.45
11. To be pushed when in a crowd.....	.45
12. Negroes.....	.45
13. To hear a person expressing extremely radical views on politics.....	.39
14. A person in conversation with me not paying attention to what I am saying.....	.39

15. To be with a person who behaves as if he (or she) feels very inferior.....	.37
16. The sight of garbage.....	.36
17. Orthodox, dogmatic views on religion.....	.30
18. To be with a person who behaves as if he (or she) feels very superior.....	.24
19. The odor of fish.....	.22
20. To be laughed at.....	.07
21. An acquaintance snubbing me or not paying any attention to me.....	-.05
22. A person ordering me to do something.....	-.11
23. To have to get up in the morning.....	-.39

Eight of the coefficients of association are higher than .60. In other words, people who say they are not annoyed to see a person wearing dirty clothes also tend to say they are not annoyed by those other eight things. The coefficient of association is no more than a rough index of relationship, but for this purpose, where only gross differences are desired, it has significance.

It is interesting to note the inclusion of 3., "To hear a joke or story on a sex subject when in a group of people," and 4., "To hear a man swear," in our selected eight. Apparently moral dirt and physical dirt have something in common!

The next step was to see how well a combined score of the eight predicted the degree of annoyance or non-annoyance caused by the basic situation.

Accordingly the number of "highs" and "lows" occurring among the eight annoyances was counted for each case. The former were given a numerical value of 2 and the latter a value of 0. Thus the possible scores ranged between 0 and 16.

Figure 1 shows the distribution of these scores according to the original rating of "To see a person wearing dirty clothing" as a source of annoyance. The 0 and 1 ratings are grouped because of the small number of cases occurring at that level. The differentiation, while far from perfect, is clear. If a man's score is 4 or less, there are 32 chances in 34 that he will be less than extremely annoyed by dirty clothing. Seventy-four per cent of those rating the base annoyance as "extremely annoying" received a score of 10 or more; while 17 per cent of those rating it as moderately annoying, and only 4 per cent of those rating it as slightly or not at all annoying reach or exceed that score. To put it in another way, there are only 8 chances out of 50 that a man is less than extremely annoyed by seeing a person wear dirty clothing, if his score in the eight predictive annoyances reaches or exceeds 10. And the chances are but 1 out of 50 that he will be only slightly annoyed.

It is true, then, that some annoyances tend to cluster, that is, that people who are little annoyed by a given situation or thing are likely to be also little annoyed by certain other definite things. Conversely those who are greatly annoyed by the first situation are also greatly annoyed by the others. Therefore, by ascertaining the degree of annoyance caused by the latter group we may predict with fair accuracy the degree to which a person is annoyed by the first thing. This principle being established, we may apply it to aid in the selection of applicants for particularly annoying jobs. The annoyance being known, it is

necessary to find out with what other annoyances it correlates highly, or of what constellation it is a part. With this established, applicants can be

the job. Those shown to be unannoyed by the job, so disagreeable to other people, will be selected as the safer risks, other things being equal.

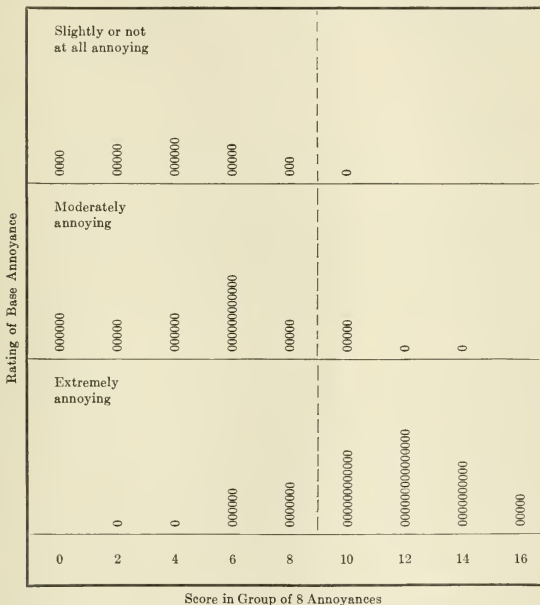


FIG. 1. SCATTER DIAGRAM SHOWING POSITIVE RELATION BETWEEN SCORE ON EIGHT PREDICTIVE ANNOYANCES AND THE BASE ANNOYANCE

examined to find out how much they are annoyed by the things in the constellation. From this we can predict how much they will be annoyed by

The method of finding out the degree of annoyance caused by the various annoyances can doubtless be improved upon, to the probable improve-

ment of the predictive power of the group. A method not dependent on verbal statements, if practicable, would appear to be superior. The writer used data that were available.

The problem of selecting workers for annoying jobs is a real one.

Methods that will improve such selection will save money, time and energy. The method suggested here is sound, promising, and therefore deserves actual trial.

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Personality Tests and Scholastic Attainment

BY A. R. GILLILAND, *Northwestern University*, AND WILLIAM H. VOAS,
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To the controversy between skeptics and advocates of personality measurement as an aid in predicting scholastic accomplishment, Professors Gilliland and Voas bring fresh evidence.

Two radically different attitudes have been held regarding personality tests. One group of students has been skeptical about their value and possibilities. The other group has often claimed more for such tests than could be justified. This article reports a study of the value of the Pressey "X-O" Test and the Colgate Mental Hygiene Tests, in predicting scholastic attainment of college students. The results, based on 144 cases, show them to be of little or no use for this purpose. That fact, however, does not invalidate the tests for other purposes.

THE purpose of this paper is to report a study of two well-known personality tests to see what they may add to the accuracy with which a general intelligence test will predict scholastic success. The problem will be attacked from three points of view: first, we shall see how accurately each of the personality tests alone will predict relative standing in classroom grades; second, we shall combine each possible pair of the personality tests by multiple correlation to see if the accuracy of their prediction is increased; and third, we shall combine each personality test with an intelligence test to see if it raises the predictive value of the intelligence test.

The tests used are: the X-O (cross-out) test of Professor S. L. Pressey,

form A¹, and the *Colgate Mental Hygiene Tests* of Professor D. A. Laird, forms B2 and C2². The Army Alpha intelligence test, forms 6 and 9, was chosen for the intelligence test. The Pressey test is a battery of four tests. Each has two scores, an "affectivity" and an "idiosyncrasy" score. The scores of the four tests are combined into a "total affectivity" and a "total idiosyncrasy" score. In the first of these tests the subjects are asked to go through twenty-five lists of five words each and cross out all words that are unpleasant to them. The number of

¹ Pressey, S. L. "X-O" Tests for Investigating the Emotions, C. H. Stoelting Co., 3037-3047 Carroll Ave., Chicago, Ill.

² Laird, Donald A. *Colgate Mental Hygiene Tests* forms B2 and C2, Hamilton Republican, Hamilton, N. Y.

words crossed out is the affectivity score. The subjects are then asked to encircle the most unpleasant word in each of the twenty-five lists. The word most frequently encircled by college students has been determined for each list, and that word is designated the norm word for the list. The idiosyncrasy score is simply the number of lists in which a subject encircled some word other than the normal word. The second of the four tests is adapted from the Kent-Rosanoff³ free association test, the third is a moral judgment test, and the fourth is a

this test are arranged in the form of a rating scale rather than calling for simple "yes" or "no" answers as the Woodworth inventory did. The C2 form is an introversion-extroversion test also arranged as a rating scale. The subjects are asked to rate themselves only.

The subjects were students in several classes in general psychology. Some of the material was given to 239 students, but, when those who failed to take one or more of the tests were eliminated, there remained 144 cases. The semester average grades were ob-

TABLE 1

Correlations obtained between the scores on each pair of tests and between the scores on each test and the semester average grades

	SEMESTER AVERAGE	ARMY ALPHA	COLGATE B2	COLGATE C2	PRESSEY IDIO- SYNCRASY X-O
Army Alpha.....	.43±.046				
Colgate B2.....	-.10±.056	-.24±.053			
Colgate C2.....	.06±.056	.00±.056	.34±.05		
Pressey Idiosyncrasy X-O.....	-.21±.054	-.20±.054	.12±.055	.06±.056	
Pressey Total Affect- ivity X-O.....	-.02±.056	-.19±.054	.24±.053	.10±.056	.11±.055

"complex-tapper" designed to discover paranoid, neurotic, shut-in, melancholic, and hyperchondriacal personalities. All are built upon the same plan.⁴

The B2 form of the Colgate Mental Hygiene Tests is derived from the Woodworth *Psychoneurotic Inventory*⁵ used in the army. The questions in

tained for the same semester in which the tests were given. All the correlations in this paper are based upon the 144 cases, and are calculated by the common Pearson formula.

THE RESULTS

Table 1 gives the correlations obtained between each two of the tests, and between each of the tests and semester average grades. It is evident that the scores on these tests as they stand alone are of no prognostic value. Aside from the correlation of Army Alpha with the semester average grades, there are only three correla-

³ Kent, G. H. and Rosanoff, A. J. A Study of Association in Insanity, *Am. Jour. Insanity*, LXVII, 37-96, pp. 317-90.

⁴ Professor Pressey speaks of this as an attempt to investigate Freudianism experimentally.

⁵ Woodworth, R. S. *Personal Data Sheet*, C. H. Stoelting and Co., Chicago, Ill.

tions that exceed four times their probable error. The three are: Colgate B2 with Army Alpha, Total Affectivity X-O with Colgate B2, and Colgate B2 with Colgate C2, the last being ten points higher than either of the others. The highest correlation with semester average is the negative correlation of Pressey Idiosyncrasy X-O. It suggests that students who encircle the norm words in the Pressey X-O test tend to be the better students. Combining each pair of test scores in multiple correlation⁶ with semester average grades, we obtain the following results:

Army Alpha and Colgate B2 with Semester Average Grades. ....	.43
Army Alpha and Colgate C2 with Semester Average Grades. ....	.43
Army Alpha and Pressey Idiosyncrasy X-O with Semester Average Grades. ....	.45
Army Alpha and Pressey Total Affectivity X-O with Semester Average Grades. ....	.43
Colgate B2 and Colgate C2 with Semester Average Grades. ....	.14
Colgate B2 and Pressey Idiosyncrasy X-O with Semester Average Grades. ....	.22
Colgate B2 and Pressey Total Affectivity X-O with Semester Average Grades. ....	.10
Colgate C2 and Pressey Idiosyncrasy X-O with Semester Average Grades. ....	.22
Colgate C2 and Pressey Total Affectivity X-O with Semester Average Grades. ....	.07
Pressey Idiosyncrasy and Total Affectivity with Semester Average Grades. ....	.21

⁶ The formula used is

$$R_{c.12} = \sqrt{\frac{r^2c1 + r^2c2 - 2rc1 \cdot rc2 \cdot r12}{1 - r^212}}$$

in which *c* is the Criterion, and 1 and 2 are the two combined scores respectively. See Otis, A. S., *Statistical Method in Educational Measurement*, p. 239.

The correlation of Army Alpha with semester average grades is raised in only one case by the multiple correlation, and that is when Army Alpha is combined with the Pressey Idiosyncrasy X-O. The increase is but two points, from .43 to .45, which is too small to be significant.

Since the Pressey X-O test is a battery of four tests, it might be that grouping their scores into one composite score would cover a significant correlation of one or more of them. Therefore, the idiosyncrasy and affec-

TABLE 2

Correlations of individual "X-O" test scores with semester average grades and army alpha scores

IDIOSYNCRASY X-O	SEMESTER AVERAGE	ARMY ALPHA
Test 1.	-.000	-.076
Test 2.	-.168	-.027
Test 3.	-.136	-.159
Test 4.	-.044	-.140
TOTAL AFFECTIVITY X-O		
Test 1.	-.040	-.189
Test 2.	-.125	-.203
Test 3.	+.071	-.055
Test 4.	+.082	+.059

tivity scores of each of the four tests were correlated with semester average grades and with Army Alpha scores. The relations found are given in table 2.

There is another possible use of personality tests. They might "spot" the unusual student, that is, either the student who is high in scholastic ability and low in intelligence test scores or vice versa. If such differences are common to both ends of the distribution it would show in the correlation values in the form of a negative cor-

relation. On the other hand it is possible that a test might be very good in "spotting" one type of person and not for other types. The two tests were studied both by inspection of the scores and by a comparison of high and low quartiles on each of the tests with intelligence test scores and scholarship. Since presentation of this data would take more space than is warranted, the interested reader is referred to a Master's thesis on the subject in the Northwestern University library. Suffice it to say that there was no evidence of such spotting.

From this evidence we must conclude that the Pressey "X-O" tests did not give us valid prediction of the scholastic success of our group. The various correlations were all low with only one above .20 and that was negative. This is in contrast to the results obtained by Hoitsma,⁷ who found a correlation of $+.35$ between Colgate B2 test scores and scholarship and by Chambers,⁸ who found a correlation of

$+.54$ between Pressey "X-O" scores and scholarship. Two hundred or more cases were used in each of these studies.

What do these results mean? We cannot be certain but one thing is rather clear. Sometimes such personality tests correlate with scholarship and sometimes they do not. Thurstone⁹ has recently found no correlation between a very exhaustive test of neurotic traits and scholarship, and points out that there is probably no relation between neurotic traits and scholarship. Our conclusion is based not only upon these studies but upon previous studies made by the writers and others.

If there is often no correlation between personality test scores and scholarship this does not necessarily mean that such tests are not valuable and useful. They may have much value in evaluating the individual. It does mean, however, that they may measure traits which bear no relation to scholarship.

Manuscript received April 16, 1930

⁷ Hoitsma, R. K. The Reliability and Relationships of the Colgate Mental Tests, *J. of Applied Psychology*, 1925, vol. 9, pp. 293-303.

⁸ Chambers, O. R. Character Trait Tests and the Prognosis of College Achievement. *J. of Applied Psychology*, 1925, vol. 20, pp. 301-311.

⁹ Thurstone, L. L. and T. G. Thurstone. A Neurotic Inventory. *J. of Social Psychology*, 1930, vol. 1, pp. 1-30.

Minimum Intelligence Levels for Several Occupations

BY ALBERT SIDNEY BECKHAM, *Institute for Juvenile Research, Chicago*

The findings of several practical investigations of minimum occupational intelligence levels are here brought together in convenient form.

Tables are given showing jobs that can be performed by those with mental ages from five to twelve. Beginning with the seventh or eighth mental age level some responsibility can be delegated to employees. Mental ages between 10 and 12 are capable of routine of a high type. Laundry employees rated as excellent have the highest average intelligence. Employees who are classed good, fair, and poor have about the same average intelligence.

A NUMBER of studies have been made to establish the minimum intelligence necessary for success in specific occupations. This paper brings the findings of these investigations together, presenting in chart form those sectors of the world's work that may well be performed by persons with mental ages from five to twelve.

The large part played by intelligence in vocational adjustment warrants careful consideration of the field. Considerable work has been done in establishing minimum intelligence levels for varieties of work carried on within institutions for the mentally handicapped. Best known perhaps is the work of the late Dr. Walter E. Fernald¹ at Waverly, Massachusetts, and

G. C. Hanna,² Superintendent of the School for Feeble-minded at Fari-bault, Minnesota. In addition to this a survey reveals that several large industrial organizations are giving more and more attention to selection on the basis of intellectual suitability for jobs.

It is not meant to imply that all vocational maladjustment is due to intellectual difficulties. Many are emotional. However, this paper is limited to a statement of minimum intelligence necessary to profitable pursuit of a number of occupations. Occupations requiring a mental age of more than twelve years are not included.

of the American Association for the study of the Feeble-minded.

¹ C. S. Raymond, *Industrial possibilities of the feeble-minded within an institution*, Proceedings of the Fiftieth Annual Session

² G. C. Hanna, *Efficiency of the mentally defective*, *University of Minnesota Bulletin*, College of Education, Monograph No. 7.

TABLE 1
What mental ages of five can do

BOYS	GIRLS
1. Wash dishes	1. Follow a pattern in simple sewing
2. Sand paper furniture	2. Pare vegetables
3. Scrub and polish floors	3. Cut rags in accurate strips
4. Feed and fold from mangle	4. Wash dishes (by hand)
5. Simple domestic work	5. Sew rag carpet
6. Brush makers' assistant	
7. Handle cinders and garbage	
8. Make nets	
9. Cut rags in accurate strips	

TABLE 2
What mental ages of six can do

BOYS	GIRLS
1. Mow lawn	1. Crochet open mesh
2. Kitchen scullion	2. Weave rag rug with pattern
3. Mix cement	3. Simple laundry work
4. Handle freight	4. Operate mangle
5. Brush making	5. Fold clothes
6. Simple laundry work	
7. Assist brick mason	

TABLE 3
What mental ages of seven can do

BOYS	GIRLS
1. Rough painting	1. Knit neckties and scarfs
2. Simple shoe repairing	2. Plain and Italian hemstitching
3. Drive 2-horse team	3. Cross stitch
4. Plow	4. Braid
5. Blacksmith assistant	5. Sew rags for rugs
6. Chair cane	6. Simple domestic work
7. Make brooms	7. Hand ironing
8. Simple carpentry	8. Simple packing of small articles. (Pow- der puffs, etc.)
9. Domestic work	

TABLE 4
What mental ages of eight can do

BOYS	GIRLS
1. Handle coal, ashes, and clean tubes	1. Stitch neckties (filet from pattern)
2. Pitch and load hay	2. Make baskets
3. General barn work	3. Operate bead loom (pattern)
4. Paint outside and interior flat work	4. Stencil work
5. Cut hair and shave	5. Dress doll without help
6. Shingle and set glass	6. Operate scarf loom
7. Make wooden toys	7. Make dresses cut out by others
8. Make nets	8. Plain ironing
9. Garden work	9. High grade domestic work
10. Repair mattresses	10. Hand weaving and knitting

TABLE 5
What mental ages of nine can do

BOYS	GIRLS
<ol style="list-style-type: none"> 1. Entire process of broom making 2. Foot power printing press 3. Block paper into pads 4. Repair furniture 5. Paint toys 6. Higher processes of shoe repairing 7. Harvest vegetables and fruits 8. Mattress and pillow making 9. Learn an alto horn and manipulate drums 10. Fancy brush making 	<ol style="list-style-type: none"> 1. Knit stockings and mittens 2. Fancy basket making 3. Cloth toy making 4. Pottery making 5. Operate automatic rug loom 6. Cut out and make dresses 7. Plain cooking 8. Pillow lace making 9. Sew in lining (hat industry) 10. Sew mounts on cardboard 11. Sew buttons 12. Make novelties

TABLE 6
What mental ages of ten can do

BOYS	GIRLS
<ol style="list-style-type: none"> 1. Setting and sorting type 2. Sign painting 3. Electrician assistant 4. Steamfitter's assistant 5. Form making for cement and floors 6. Shellacing and varnishing 7. Learn bass horn and cornet 8. Laundry work (detailed) 9. Garden work (detailed) 10. Farm work and dairying 11. Carrying mail 	<ol style="list-style-type: none"> 1. Raffia and reed work (pattern) 2. Basketry 3. Swedish embroidery 4. Operate sweater machine 5. Operate looper for stocking toes 6. Starching and polishing (laundry) 7. Fancy laundry work 8. Fancy cooking, cakes, candy 9. Canning 10. Learn cornet and saxophone

TABLE 7
What mental ages eleven and twelve can do

BOYS	GIRLS
<ol style="list-style-type: none"> 1. Competent janitors 2. Stock keeping 3. Store keep (small) 4. Labeling and checking 5. Green house attendant 6. Lawn (care taker) 	<ol style="list-style-type: none"> 1. Sew garters and powder puffs 2. Sew wire edges and facing in hats 3. Simple library work 4. Italian cut work in embroidery 5. Power sealing in canning plant 6. Learn first violin, cello, flute, and clarinet

The material presented was drawn from investigations³ in the fields of psychology, psychiatry, and education. Tables 1 to 7⁴ are arranged by sex and by the mental age levels. Each job or industry is placed at the level at which the minimum mental age can best succeed. Most of these are quoted from two or more sources.

TABLE 8
Classification and mental ages of 20 laundry employees

EXCELLENT		GOOD		FAIR		POOR	
yrs.	mos.	yrs.	mos.	yrs.	mos.	yrs.	mos.
11	2	10	2	9	2	8	2
10	4	8	4	7	6	7	6
9	4	8	2	7	6	7	4
9	2	7	4	7	4		
7	6	7	4				
7	2	7	2				
		6	8				
Average M.A.							
9	1	7	11	7	11	7	8

INTELLIGENCE OF LAUNDRY EMPLOYEES

The writer made a more detailed study of the intelligence of laundry employees in relation to the quality of

their work. A questionnaire was prepared requesting laundry managers to rate their employees in four divisions as excellent, good, fair, and poor according to their work. Twenty persons were rated by the laundry managers. After these ratings were obtained, the 20 employees were tested on the Stanford Binet.

Table 8 contains the four classifications of the employees according to the ratings of the laundry managers, the mental age of each employee, and the average mental age of each group.

The 20 employees range in age from 14 years 1 month to 24 years 3 months. Six of the employees received a rating of excellent. They range in mental age from seven years two months to eleven years two months. The average mental age of this group is 9 years one month.

Seven of the individuals received a rating of "good." The mental age range of these employees is six years eight months to ten years two months. The average mental age for this group is seven years, eleven months. Four persons were classified as "fair." This group has a mental age range from seven years four months to nine years two months. The average mental age for this group is also seven years eleven months. Only three persons were classified as poor in their work. The range of the poor or lowest group is seven years four months to eight years two months. The average mental age of the lowest group is seven years eight months.

The excellent group is considerably higher in average mental age than the other three groups. There is much

³ For valuable information and suggestions, the writer wishes to express his indebtedness to Walter V. Bingham, Director of the Personnel Research Federation in New York, to Andrew W. Brown, chief psychologist, and Miriam Geyer, psychologist, Institute for Juvenile Research, and Emily Burr of the Vocational Adjustment Bureau in New York.

⁴ Tables 1 to 7 cf. *Industrial Possibilities of Feeble-minded* by C. S. Raymond, op. cit., *Occupational Efficiency of Defectives*, by G. C. Hanna op. cit., and Douglas Fryer, *Occupational Intelligence Standards*, *School and Society*, vol. 16, p. 276.

overlapping of mental ages in the four groups.

Some of the qualities that influenced the laundry managers to rate high were "congeniality on the job, desire to please, ability to get along with others, willingness to obey directions, and resourcefulness." Some of the factors that determined a low rating were, "laziness, quarrelsomeness, profuse profanity, forgetfulness, inefficiency and general ignorance."

SUMMARY AND CONCLUSION

1. A considerable amount of responsibility in industry can be placed on both sexes at the eighth year mental age level. This intelligence is sufficient to cut hair and shave and for high grade domestic work.

2. Individuals with mental ages between 10 and 12 are capable not only of much routine but also a considerable amount of intelligent responsibility and supervision as storekeeping and the general routine of a hat or dressmaking establishment.

3. Among the 20 laundry employees in this study the excellent workers have an average mental age of 9 years. A higher intelligence is found in excellent work than in the other grades. There is but little difference in the intelligence of the good, fair, and poor workers. Apparently factors other than intelligence are of great importance for success in the laundry craft, assuming a seventh or eighth year minimum mental age level.

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Store and School

Factors in the Success of Department Store Workers

BY CORA C. ALDERTON, *Vocational School of Minneapolis*

The head and coordinator in the Retail Training Department of the Vocational School of Minneapolis has followed the progress of the girls in their later employment. She here compares their success with their school histories, their native intelligence, and their personal traits.

A positive relation is found between intelligence test grades and success of girls in department store work. Financial promotion is partially dependent on tenure of employment. Selection of employer ranks high in determining wages for the first five years. Girls doing sales work generally earn more money than those in non-sales departments. Success is further dependent on personal qualities.

IN A vocational school the problems of occupational guidance are perennial, immediate and crucial. We live in daily and hourly contact with the results of our counselling, good or bad. Since 1923-24 in the Girls Vocational School of Minneapolis we have been accumulating facts about our youthful entrants into the retail training department along with what these girls could reveal to us of store work in terms of their own mental, physical and other personal characteristics. Each new class presents the same questions in appealing animation. Who succeed in department stores? What are the prospects as to wages and types of jobs? These hundred odd girls have been busy the past five years digging out of life the answers to their own questions. For the benefit of other youngsters who

will ask these same questions, this paper presents an attempt to group and unify these varied personal experiences into objective comments on the occupational sector thus illuminated.

The girls who enter this department usually vary in age from fourteen to sixteen and one half years. Most of them come from an economic level which necessitates their becoming self-supporting at an early age. The great majority come from homes with a long history with the social agencies. By and large, these girls have not succeeded with the grade school work or the first year of junior high school.

Some of the girls have elected to work in the stores, others have not been permitted to take stenography on account of academic or intelligence rating and for them the course is a second choice. A considerable num-

ber comes because of the compulsory school law, only to withdraw at 16 years.

The students are placed in advisory groups according to social factors, such as maturity, rather than on the intelligence basis.

The girls are rated carefully as to health, personal appearance, attitude and industry. Those rating satisfactorily are placed on a working list of each advisory room or group. The department stores call when in need of extra help and these girls on the working list are sent out to work for a day at a time, or longer in the case of the older and better prepared girls.

Trade training is given in the stores by their education department instructors and by helpers on the job. This training is supplemented in the school by the teachers. Training in specific jobs is given when the stores need extra people as on special sale days, and in rush seasons. Since there is rotation among the stores of the big annual sales the girls in training get experience on a variety of jobs in several stores. Frequently these girls prove specially valuable in particular stores and become regular Saturday "extras." Experience is generally such that by the beginning or during the third term the girls have a decided preference for a particular store. The election of a preferred store is encouraged and such girls are kept on a special reserved list for one store and rarely work anywhere else. In general the proportion of time spent in the actual trade work increases with the length of time the girl remains in school.

As the following report will show, the size of the graduating classes is

increasing and along with that an increasing number of girls who are over the compulsory school age are staying the full two years and are receiving diplomas. At the present time about twenty-three per cent remain to graduate.

THE DATA

The data of the following report have been gathered in the six years from 1923-24 to and including 1928-29. In that time there have been graduated six classes with a total of 95 members of whom three were boys. During the past six years no new boys have been enrolled and only those were graduated who would have had to lose ground by beginning another course. No further account will be made of their cases in this report. The number of graduates by years from 1924 to 1929 inclusively have been, 12, 13, 13, 15, 15 and 27.

For this discussion a person is considered to be "in the trade" if she is in any position in a store secured as a result of her connection with the retail department of the school.

GENERAL ANALYSIS OF DATA BY CLASSES

Class of 1924: In this class there were ten girls and two boys. Six of the girls are in the trade, one is married and keeping house, one deceased (tuberculosis), one is in the local telephone company, one in a clerical position in a bank. Among the six in the trade the wages range from \$12 to \$27 a week. Their jobs are distributed as follows:

2 cashiers:
at \$12 a week

- 1 office
at \$13 a week
- 3 selling
at \$12 plus 2½ per cent commission on sales
at \$20 guarantee on 7 per cent selling basis
at \$27 guarantee on 7 per cent selling basis

Class of 1925: There were 13 in this class, one being a boy. Of the girls, six are in the trade, one is keeping house, one is in the telephone company, two are in offices, one is a nurse, and one was not definitely located at the time of the report. Their wages range from \$12 to \$25 a week as follows:

- 1 bundler:
at \$12 a week
- 3 clerical:
at \$14 a week
at \$19 a week plus an annual share of profits
at ?
- 2 selling:
at \$25 a week
at \$20 a week plus 2 per cent above quota

Class of 1926: Of this class of 13, seven are in the trade, two are keeping house, one in the telephone company, one is a stenographer, one a clerk in a hotel in Chicago at last report, and one is unemployed. For those in the trade the wages range from \$12 to \$30 a week as follows:

- 1 writing checks and selling at \$12 a week
- 1 on the credit desk at \$13 a week
- 1 assistant paymaster at \$15 a week
- 1 receiving clerk at \$16 a week
- 1 receiving clerk at \$18 a week
- 1 selling part time at ? a week
- 1 selling at \$15 a week plus \$15 on a side-line

Class of 1927: Of these fifteen girls 12 are in the trade, two are keeping house, one is not located. The twelve in the trade receive wages ranging from \$12 to \$25 a week as follows:

- 2 are wrappers at \$12 a week
- 1 in stock work at \$12 a week
- 1 in office at \$13 a week
- 1 charge authorizer at \$13.50 a week
- 1 cashier at \$14 a week
- 1 cashier at \$15.00 a week
- 1 selling at \$16.50 a week plus a semi-annual bonus on the department profits
- 1 selling at ?
- 1 hosiery repair at \$25 a week
- 1 modelling and selling at \$25 a week

Class of 1928: Of this class of 15 all are in the trade. Their wages range from \$12 to \$17 a week as follows:

- 6 are wrappers or cashiers at \$12 a week
- 1 order board operator at \$12 a week
- 1 selling at \$12 a week
- 1 elevator operator at \$12 a week
- 1 charge clerk at \$13 a week
- 1 cashier at \$14 a week
- 1 messenger and stock at \$14 a week
- 1 selling and bookkeeper at \$13.50 a week
- 1 selling at \$12 a week plus 2 per cent on net sales
- 1 biller at \$17 a week

Class of 1929: Of the twenty-seven in this class 24 are in the trade, one is keeping house, one moved away and is in a clerical position, and one is marking shoes in a factory. Among those in the trade, the wages range from \$12 to \$15 a week:

- 19 bundlers, stock girls, etc., at \$12 a week
- 2 selling at \$12 a week
- 1 selling at \$12 a week plus 2½ per cent
- 1 selling at \$15 a week
- 1 cashier at \$14 a week

There are girls in every class from 1924 and including 1929 who are in the minimum wage group of \$12 a week. This does not mean that they have stayed at just the same wage level all this time. In 1924 and 1925 several of the girls began at the apprenticeship wage of \$9.12. They have received actual advances in wages though they are at the same level as the girls who started this year. It is also noticeable that certain girls are getting better than the average of their classmates. To account for these variations and, if possible, isolate some of the characteristics of the more successful girls or the conditions under which they succeed better, further grouping of the data has been made.

INTELLIGENCE COMPARED WITH OTHER FACTORS

Since the minimum wage is fixed at \$12 a week for those who have had nine months experience, we may interpret that wage as meaning one of four things. It may be the beginning wage; it may mean a job which pays only that amount; it may mean the policy of the store towards wages in general; or it may mean an individual who does not merit promotion in the opinion of those in authority.

Different stores have very different rates of promotion as reflected in wages. An increase of \$.50 a week in one store may mean as much in the way of recognition as \$2 or \$3 a week in another store. By and large, anything above \$12 a week means promotion of a sort and we may use this figure for dividing our cases.

In order to determine the relation between intelligence as measured

by the Terman group test and success of the girls on the job as reflected by wages received, the workers are divided into four groups on the basis of IQ scores. In the following distribution none of the 1929 class are included.

From 80 to 89 IQ, 7 cases are getting \$12, 3 cases more, average \$12.40, maximum \$14; from 90 to 99 IQ, 6 cases are getting \$12, 10 cases more, average \$16.06, maximum \$30; from 100 to 109 IQ, 2 cases are getting \$12, 9 cases more, average \$16.09, maximum \$25; from 110 to 113, none are getting \$12, 2 cases more, average \$13.25, maximum \$13.50.

The two girls in the highest group are in the same store, both have had regular promotions but are apparently handicapped by the wage policy of this store. Wages in relation to their intelligence scores probably have little significance.

Fifteen girls get \$12 while 24 get more. Seven of the fifteen in the minimum wage group come in the lowest of the four IQ divisions.

If we accept this rough division of wages as being logical, there is, in our limited sampling of cases, a marked tendency for the promotions to go to those with the higher IQ scores. Girls with academic ability which would make it possible for them to succeed in high school have good chances for promotion in this occupation.

TENURE AND WAGES

There are still further conditions and qualifications to be examined if one is to refine the guess as to the probable success of particular girls.

TABLE 1
Tenure and wages in four stores

	STORE A		STORE B		STORE C		STORE D	
	Job	Wage	Job	Wage	Job	Wage	Job	Wage
5 years or over	AG sell MH sell MM sell	\$12.00 plus 2½% 20.00 27.00	LH order board	\$12.00	AF wrap SC office	\$12.00 13.00	RW stock	\$12.00
4 years or over	RH mail-order BS rec. room FR sell	14.00 14.00 20.00 plus 2% comm.	None		BC wrap VO cler.	12.00 14.00	LJ cash	12.00
3 years or over	EH cash AJ rec. room	16.00 16.00	EP transf.	16.00	EC sell	12.00	ML wrap BB rec. room CI office	12.00 12.00 13.00
2 years or over	AK cash LR stock	14.00 14.00	VB wrap	12.00	TC sell CG chg. C. HM mark CW office	? 15.00 12.00 13.00	EC stock DS office HT wrap	13.50 13.00 12.00
1 year or over	JA ex. desk LK cash EP office	12.00 14.00 17.00	LE sell MG mark MH mark	14.00 12.00 14.00	EN mark AP mark LP wrap DR wrap KA wrap MH wrap MJ wrap LL wrap RK order board DY sell	12.00 12.00 12.00 12.00 12.00 12.00 12.00 12.00 12.00	MT wrap AB cler. PB wrap FR wrap	12.00 13.00 12.00 12.00
Less than 1 year	FG stock BJ stock NJ stock JM cash MS cash ES wrap JW wrap EB cash DB office MB wrap AE sell	12.00 12.00 12.00 12.00 12.00 12.00 14.00 12.00 12.00 plus 2½%	HD wrap RD wrap LD wrap AE wrap	12.00 12.00 12.00 12.00	MK wrap MS sell MA wrap EC wrap MC sell HS wrap AT sell GW wrap LW cash VJ wrap	12.00 12.00 12.00 12.00 15.00 12.00 12.00 12.00 12.00 12.00	CJ rec. room MA rec. room	12.00 12.00

What are the chances of promotion if one stays in the business a number of years? Summarizing our facts from the detailed analysis of classes, the chances that a graduate of the course will be getting more than \$12 a week are:

In 5 years.....	3:1
In 4 years.....	5:1
In 3 years.....	5:1
In 2 years.....	4:1
In 1 year.....	2:3
In less than one year.....	1:7

A second question that naturally grows out of this one is whether one might expect equally surely that there would be promotions if one remained in the same store for several years. In table 1 we have listed all the cases of graduates and a few nongraduates who are working in four stores together with their jobs and wages.

In the opinion of the writer the cases here set down represent quite fairly the variations in four typical stores. It is evident that there is no trade uniformity of practice as to promotions in wages though individual stores show high consistency with their own policies. Store A has a wage range for the five years of from \$12 to \$27; Store B from \$12 to \$16; Store C from \$12 to \$15; Store D from \$12 to \$13.50.

Further, it should be noted that there might be an opportunity for the junior girl to get into the selling force within the first year in Stores A, B, and C. In Store D there is a ruling that salespeople shall be 21 or more years of age. In this store office positions are considered as promotions from desks. It is the capacity for responsibility and maturity of appearance that is demanded by this store

which accounts for the rule as to age. There has been a notable exception during the past five years in the case of one of the graduates who worked up to an assistant buyer's position and later took a similar position out of town.

In drawing conclusions from this table it should be kept in mind that all these girls are under twenty-five years of age and also that all the positions accounted for are but a fraction of those in any one of the four stores. With that in mind, it is nevertheless apparent, that policy varies from place to place and that success as measured in wages during the first five years is conditioned by the choice of employers.

WAGES AND TYPE OF JOBS

What can our cases show of the variation of wages with jobs? Below is a distribution of the cases by store, job and weekly wage. Again a few drop-outs have been included with the graduates.

Job: Cashier-wrapper-bundler

Store A	Store B
1 @ \$16.00	1 @ \$16.00
2 @ 14.00	1 @ 14.00
6 @ 12.00	4 @ 12.00
Store C	Store D
13 @ \$12.00	1 @ \$13.50
	5 @ 12.00
Store X	Store Y
1 @ \$15.00	1 @ \$15.00

Job: Stock work

Store A	Store D
4 @ \$12.00	1 @ \$12.00

Job: Receiving Room Clerk

Store A	Store D
1 @ \$16.00	2 @ \$12.00
1 @ 14.00	

Store X
1 @ \$18.00

Store Z
1 @ \$12.00

Job: Office (clerical)

Store A
1 @ \$17.00
1 @ 14.00
1 @ 12.00

Store D
3 @ \$13.00

Store C
2 @ \$13.00

Job: Selling

Store A

2 @ \$12 plus 2½% commission on net sales
1 @ 12 plus 2% above quota
1 @ 20 plus 2% above quota
1 @ 20 on 7% basis
1 @ 27 on 7% basis

Store C
1 @ \$15.00
3 @ 12.00

Store B
1 @ \$14.00

*Other selling positions outside of Stores
A, B, C, and D*

1 @ \$16.50 plus semi-annual bonus on
department
1 @ 15.00 plus 4 per cent above quota
2 @ 12.00
1 @ 13.00 (bakery goods)
1 @ 13.50 (grocery)
1 @ 15.00 (delicatessen department)
1 @ 15.00 (jewelry)
2 @ 25.00 out of town

This compilation confirms the general impression that those who are in the places where the actual exchange of goods and money takes place have the best opportunity to demonstrate arithmetically their value to the business. Sales people are recruited from non-selling jobs within the organization and from the outside. The proportion of selling and non-selling jobs varies with different stores from one to two, or even as high as one to three, respectively.

PERSONAL QUALITIES AND SUCCESS

We have considered the effect of various factors in determining success, such as native ability as represented in IQ score, length of time in the trade, selection of a particular store with reference to wage policy, and choice of jobs within a given store. There remain certain cases without adequate explanation. Employees with sufficiently high intelligence, and with years enough to their credit to be getting the maximum for their group, are seen to be getting the minimum or are out of employment altogether. Below are given descriptions of eight persons who lost jobs.

E. P., IQ 110, class 1929. Was let out of her job about January first 1929 because of personal difficulties with another girl on the same desk. Her work had been considered entirely satisfactory both during her training period and after placement. The employment manager attempted to straighten matters out by separating the two girls. When matters did not clear up there seemed no course open except to dismiss both girls.

E. E., IQ 80, class 1927. Unmarried mother.

A. P., IQ 98, 1926. Conduct outside the store was such that it seemed inadvisable to have her associated with the business. She was getting \$14 a week in a job which she told the co-ordinator offered every chance for advancement. While in school she was personally dirty, coarse in manners and generally vulgar in attitudes.

E. S., IQ 81, 1929. Is working at present but was let out of her first job because of gossiping about the business.

E. B., IQ 84, 1927. Has never had a permanent job but has been called frequently as an extra. The criticism of her during the training period was that she was too talkative. Her case was persistent and flagrant.

H. N., IQ 92, 1926. Has bad habits of eating, stubbornly refused to seek or take good advice or to try to eat sensibly. She lost her first job because of the anxiety caused other employees who feared that she had contracted tuberculosis. She secured another job after several months but is now working part-time because of her health.

I. J., IQ 85, 1925. Was dismissed after several months because of slackness in matters of personal responsibility. Club members in her store had to appeal to the education department repeatedly to get her to return athletic suits and equipment which belonged to the club.

I. W., IQ 85-90, ex 1926. Failed in her training work because of being too "bossy." She gave orders to other girls about her without authority.

Other criticisms made by the store supervisors are on such personal matters as unbusinesslike dress, unkempt hair, personal uncleanness, untidy clothes. Some girls now in positions have had such criticisms made but have corrected the matter or have gone where such refinements were not an asset.

In none of the above cases were the girls dismissed because they could not do the specific task assigned them. With the careful selection of the girls and the periods of tryout on the jobs during training, it is rare indeed that

one of these girls is dismissed because of being unequal to the work itself. Their failures have been due to the lack of such social qualities as good manners, acceptable standards of personal conduct, and the ability to co-operate. There is interesting corroborating evidence reported in "Causes for Discharge" by John M. Brewer in the *PERSONNEL JOURNAL* for October, 1927. He says of the 4375 cases tabulated that "the social understanding causes constitute the controlling reasons in about five-eighths of the cases" [of discharge]. The proportion of failures because of social reasons in this semi-public occupation would doubtless be much higher than in the cases studied by Mr. Brewer.

SUMMARY

This report necessarily remains inconclusive. However, we find support for opinions which we have held with more or less faith, namely, that such abilities as are measured by the intelligence tests have significance in selecting junior employees of retail stores; that there is a difference between the higher and lower groups in the probability of wage advances; that the dividing line for the type of stores considered is in the neighborhood of 89 IQ.; that within the limit of these records, wage increases generally vary directly with the length of employment; that personal and social factors have an importance even greater than that of intelligence above a fairly definable minimum; that the selection of the employer ranks high in determining one's wages for the first five years.

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Vocational Guidance and Selection in Belgium

By A. G. CHRISTIAENS, *Brussels*¹

Professor Christiaens, distinguished leader in the administration of vocational guidance, is Director of the Intercommunal Office for Vocational Guidance and Placement of Boys and Girls in the Brussels District. Ten communes are associated in this public undertaking, which is supported by the Province of Brabant and the Belgian Ministry of Labor.

I. OCCUPATIONAL ORIENTATION

OCCUPATIONAL orientation or vocational guidance has been investigated since 1909 by the members of a private society, "La Société Belge de Pédotechnie." Its founder and principal worker was Mr. Arthur Nijns. In the beginning the problem was examined only from an academic point of view, the so-called "Brussels System" not taking on a precise form until about 1913.

The axioms which have been adopted are the outcome of long experience; theory has been inspired directly from practice. These few axioms and principles are as follows:

1. Native disposition is of primary importance. All that may be acquired is secondary. What has been acquired may serve as example and as information. One proceeds from this

dominant idea: A child whose early education has been neglected, or who has been adversely affected by unfortunate circumstances, may be instructed or improved. Lack of schooling is therefore a factor to be reckoned with, but is not primary.

2. Success in most occupations requires special aptitudes.

These aptitudes are the direct cause of the specific state of the organism, giving more or less scope to reaction due to stimulation and environment. This state evidently varies according to the individual and to hereditary forces. According to the degree of amplitude of reaction produced by stimulation and according to changes they produce in the tissues, acceleration is more or less deeply marked, and aptitudes are feeble, average, strong or very strong.

Native disposition is the source of aptitude. The measure of this native disposition is the subject's education.

We will take notice only of the dis-

¹ Office Intercommunal pour l'Orientation professionnelle et le Placement des Jeunes Gens et des Jeunes Filles dans l'Agglomération Bruxelloise.

This article was prepared by the author in English.

positions which differ markedly in different individuals. A great many dispositions are possessed by nearly all people; in them individuals may differ only to a small degree. On the other hand we may designate as "Special Aptitudes" those which are most important in adaptation to work, and without which the worker cannot produce a really superior product.

3. To determine these special aptitudes one must analyze the occupation with the aid of an expert technician. This occupational research can be made useful only by discovering the differences between very good workmen and average workmen. To this end it is necessary: (a) to observe the worker at his work; (b) to conceive or to choose tests that will measure the more important functions necessary to success in the given occupation; (c) to repeat these tests, or if necessary to renew the whole process of examination, until one has found the functions which differentiate excellent workers from average workers; (d) to examine the apprentice on the basis of the information already acquired and to formulate a prognosis from this; (e) to follow up the apprentice and to compare his later success and revealed qualities with the prognosis.

4. All dispositions and counter indications of a physiological order must be determined by a qualified physician. Sensory aptitudes may be investigated by a vocational guidance specialist. Only in exceptional cases, where there is doubt, must one have recourse to a medical specialist.

The examination of each subject from a physiological standpoint really ought to be made only by a physiolo-

gist. This however, is practically impossible. The physiologists (those who are really worthy of the name) are too rare and would hesitate to undertake such heavy responsibility. In order to overcome this obstacle, guidance counselors should be trained by such specialists.

Along these lines the Intercommunal Office of Occupational Orientation of Brussels, in collaboration with the Institute of Higher Studies of Belgium, has conducted a special series of courses since 1923.

5. The choice of an occupation cannot be wisely made without taking into consideration two additional factors: the state of the labor market, and the immediate future of each occupation.

This method of occupational orientation has been evaluated by means of controlled studies. The results were published in Bulletin No. 29 (1928) by the Intercommunal Office. It has been put into practice in different suburbs of Brussels, Schaerbeek, St. Josse ten Noode, and elsewhere. The local offices of these suburbs are very well organized.

According to a more comprehensive plan, Mr. Rouvroy, director of the Central Station for Observation at Moll-Huttes, places as the basis of re-education of children confined to "reformatories," the necessity of moral recuperation. Occupational orientation here becomes only the final chapter in the medico-psycho-pedagogical analysis of each subject.

In order to keep unbroken the social development of the adolescent and to utilize his past life in order to build up the future as surely and as promptly as possible, he has adopted the method

of elimination. He asks first, what was the theoretical and practical occupational instruction received by the subject before his transfer to the Observation Station? (It is necessary to begin the moral and a social re-education of the subject without loss of time.) Second, what are the motives or reasons for his like or dislike of any given subject? This is an important factor in the moral re-education. Third, which of his preferences are the more acceptable to his family? (The most desirable solution is that the child return to his parents with future intentions which will be most acceptable to them.) Fourth, which are the basic aptitudes or inaptitudes of the subject for the occupation which was proposed or practiced before commitment, or for the occupation preferred by either the subject or his parents? Fifth, what surrounding conditions must be observed? Sixth, what is the final occupational diagnosis? (General occupational orientation and trials are given in different lines in succession according to possibility of success.)

In Charleroi, an industrial center of importance, in the province Hainaut, Mr. Jules Hiernaux, director of the Charleroi Trade School has undertaken to establish a center of occupational orientation according to his own

particular ideas. Here are his views on the subject:

To begin with, we allow the pupil to choose his occupation, leaving him free to all influences, to the advice of parents, friends, and school master. As soon as he has made his choice a preliminary examination is given. A physician examines cases where there is doubt as to the physical ability of a child to carry out a chosen occupation. This sometimes brings a change of specialty and sometimes the abandonment of this school for another. The young men are then observed during their stay at school. We observe their physical development, noting any possible defect due to the special trades chosen. We have followed only the careers of the subjects where there was doubt, but in the future observation will be made of all students and we will try to extend this observation to graduates until the age of twenty.

The general director of the Charleroi School of Trades has no confidence in the present status of tests. Until their absolute value is definitely proven he prefers to have nothing to do with them. The difficulties of occupational orientation appear to him to be not only numerous but nearly insurmountable.

II. OCCUPATIONAL SELECTION

Occupational selection, a branch of psychotechnics, is even more recent. It dates from after the war.

A first trial in selection of street railway motormen took place in the Brussels Tramways in 1921. It was directed and supervised by Dr. Houd-

mont but has been abandoned for years. In 1923 one of our most prominent industrial companies doing work of a mechanical sort experimented with tests, and after having sufficient guarantee of success, inaugurated a service of selection with the intention of apply-

ing the system to recruiting its numerous personnel. (At the present time they employ 9250 workmen and 1500 other employees). This company is headed by men of great prudence who, realizing that their prestige may cause others to imitate, wish to prove or disprove the value of tests before leading others to use them.

The systems at present in use, which are naturally and logically only temporary, are very restricted in their scope. The tests used are culled from different sources known to psycho-technical specialists. Some of them were taken from Thurstone and Thorndike in the United States. The American system of presentation has been adopted in most cases, probably because of the saving in time, and its facility for group examination. Russian and German tests are also used.

When we speak of the "system at present used" we without doubt make a mistake. In reality it is only a matter of a conglomeration of hypotheses which is being carefully sifted with much patience. One experiments and makes forecasts, takes note and abandons certain ways and means which have proved faulty. And this is the best way possible, for eventually the best method of selection will be forthcoming. The attitude of the executives of the company on this score is remarkable. They are able to contain their impatience, they know exactly what they are aiming at, and they understand that hurry is useless. This broad-minded attitude in face of so new a problem happily negates any desire for undue haste as is so often the case when business men treat psychotechnic matters like any other new

material from which some special usage is required, and a given output expected.

The company saw perfectly well that after the Armistice it would be necessary to look after the occupational education of its workers. It not only formed a school for its apprentices, but also centers of training for its workmen, for its department heads, for its engineers and for all others.

Up to the present time tests have been used only for the selection of apprentices to the industrial school, of boys for assembling machines, and of the feminine workers. Methods of selecting qualified workmen are in preparation, and soon new trials will be made.

For each group of workers a special cardex is prepared. The tests of course differ according to the case in hand, but all are of the same order. One tries to get to the bottom of the mental functions, muscular force, endurance, and so on.

Space is not available for details. The first work undertaken was the classification of the tests according to the scheme of Claparède. The subject's scores are recorded in profile.

In May 1928 we started a second experiment on selection, this time in an important colonial firm which requires a very diverse personnel. Not only do they require men who have perfect trade knowledge, but who have, over and above their practical knowledge, the necessary constitution with which to live the colonial life. They must be adaptable to the climate, to discipline, and to separation from friends and families. They must be men who

can understand the native psychology and who will be capable of directing without giving rise to regrettable incidents.

In order to be able to judge of their physical state, this firm has at its disposal very capable physicians. In order to ascertain the vocational value of the applicant engaged by them, they have a method which has proved its worth. But in order to judge the other qualities required in a good colonial worker, they are experimenting with psychotechnical methods. The trials which extended over the period of more than a year have, it seems, given good results, as the firm has established on its premises a special selection service. Due to our co-operation, the loss, which was formerly 33 per cent, has been reduced to 7 per cent.

The method employed consists of tests, but these tests are not here utilized in the usual way. The subject is put in the presence of different kinds of work to be done, and by means of new apparatus his behavior is observed and noted; and it is from the point of view of his behavior that the chief of the laboratory conducts the trials. The test scores have in

many cases no particular use. It is the applicant's behavior when placed in the test situation which gives the necessary indications and it is on this basis that diagnosis is made. A man's actions are always more revealing than judgments of vague character traits. They bring out more than any cross questioning can possibly do. This is more or less new in psychotechnics, and will certainly be of interest to psychotechnicians who have just placed on their next international conference program the question of character and ways of detecting and measuring real character.

Up to the present time no other applications have been made in this country of scientific selection methods in industry or commerce.

This picture of what has already been done is probably not very imposing. But the Belgians are in general not a people to jump at new-fangled methods. They will study them slowly and carefully, wishing to make an exact evaluation of these new methods. They will adopt them only when certain of their usefulness and reliability.

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The (British) National Institute of Industrial Psychology

BY C. SCARBOROUGH, *London*

Psychologists and management engineers who have watched with satisfaction the steady growth of the National Institute of Industrial Psychology in Great Britain will be glad to see this fresh account of its aims and accomplishments.¹

This paper deals with the formation and purpose of the National Institute of Industrial Psychology and outlines the work it is doing in its factory investigations, in its personnel studies, in vocational guidance, and in research and education. It discusses the importance of psychology's contribution to industry, and the relation of the psychologist to the production engineer and to management research.

THE National Institute of Industrial Psychology was formed in 1921 for the determination and application of psychological and physiological principles and methods in the solution of industrial problems. The experiments of the Health of Munition Workers Committee during the Great War had indicated the vast possibilities of such work, and already the Industrial Fatigue Research Board was continuing the work of the Committee in the general industrial field. But whereas the Board studied problems of wide industrial significance or the problems of a particular industry

as a whole, the Institute was formed to investigate also the peculiar difficulties of the individual factories in which its investigators would work. Special conditions often make difficult the direct utilisation of the findings of a general research, while most industrial and commercial concerns have no member of their staff with the time and the knowledge necessary for the application of the methods of industrial psychology. The use of the special technique of the psychologist needs definite psychological training, and the solution of industry's problems is possible only through the cooperation of men with a sound knowledge of psychological principles and with training in the methods of applying that knowledge in the industrial field.

The Institute's investigator approaches his problems from the psychological, the human viewpoint. His

¹ For further information concerning the National Institute of Industrial Psychology see its Journal and Annual Reports, copies of which are on file at the Personnel Research Federation office, or correspond with the Director of the Institute, Charles S. Myers, Aldwych House, W.C.2, London, England.

knowledge of psychology "provides him with a weapon of diagnosis for analysing the working situation and discovering the various causes of human inefficiency and discontent." His recommendations have to be desirable psychologically, as well as sound economically. And this double criterion gives him a definite advantage over the production engineer, who is apt, through ignorance of psychological principles and data or through indifference to them, to ignore the first criterion and to lay what seems to the psychologist to be an undue stress upon the second. The psychologist has the advantage of his knowledge of the psychological and physiological differences between individuals; he realises the limits they impose upon standardisation of working method. He knows the importance of rhythm in work, and that while certain movements in a work sequence may be definitely wasteful of time and energy, there are other "useless" movements which increase productivity by making the work rhythmical. Each worker has his own individual rhythm, his own peculiar "style"; and his efficiency will be lowered if he is forced to adopt some other standardised working method. He has a further advantage in that he can use in his industrial work psychological techniques, psychological methods of experiment and inquiry. It is such realisation of the basic psychological factors involved, combined with the special methods of study, that gives the work of the psychologist in industry its peculiar value.

Recently, in a cabinet works, the Institute found that layout and routing had been planned on the gravity flow

principle. The wood was sawn on the top floor, passed to the next floor for planing, and so on. From the point of view of the production engineer the plan was excellent, but from the point of view of the worker it involved unsatisfactory conditions for just those processes on which the selling properties of the product most depended. Polishing and finishing were carried out on the worst-lit floor in the factory. The workers there had the disadvantages of poor natural lighting; their working rate was slow, repolishing was frequently necessary. Similarly, an investigation on a large liner showed that in the galley, in the scullery and at the serving places the conditions suited a left-handed man far better than a right handed man. Layout had been planned without regard for the human factor.

But the fact that the Institute is undertaking studies in management is no justification for the conclusion drawn in a recent article in this Journal that "it is more and more becoming a management research institution."² It is true that it is devoting more attention to this field of study, but at the same time it is extending its work in all other directions. It might be called a management research institution only in the sense that it is this among other things. It has amply established the value of its management research, but its activities spread well beyond this field of inquiry. And its work differs here, as elsewhere, from non-psychological research in its insist-

² Arthur W. Kornhauser, *Industrial Psychology* in England, Germany, and the United States. *PERSONNEL JOURNAL*, 1930, vol. 8, no. 6, pp. 421-434.

ence on due consideration of the human factor. In spite of Dr. Kornhauser's reluctance to admit it, the problems studied in this branch of the Institute's work are as truly psychological as those in any other branch. It is concerned here directly with the workers' environment, and it is indeed difficult to see why the study of this group of problems can justify the statement that its work is "spreading farther and farther beyond what would ordinarily be classed as psychological problems."

Many other problems—of incentive, discontent, morale, etc.—have also a psychological basis that is hidden except to the expert who has studied the intricacies of human motivation. The real motives of behaviour are rarely the apparent ones. Still less are they the ones which are often given by the person concerned. Men are very apt to act, and afterwards to think out or to rationalise about their motives. Something more than a surface knowledge of the human being is required if the cause of the trouble is to be found. It is for this reason that the Institute's investigators are all psychologists. Dr. Kornhauser's statement that "its staff already includes engineers and accountants" is definitely misleading. There are no accountants on its staff and, although certain of its investigators have had an engineering as well as a psychological training, they would never have been engaged but for their additional psychological knowledge.

Thus the general aim of the Institute in its investigations is the removal of the obstructions which prevent the worker from achieving his maximum

production. The work is studied from the worker's point of view. Very frequently the working conditions are bad: he suffers from fatigue or boredom; the lighting is inadequate or, more frequently, wrongly arranged; there is insufficient ventilation. All these points receive the psychologist's attention because of their reaction on the worker. And in removing them, he benefits both worker and employer. The worker who no longer sustains fatigue is both a happier and a better worker. The redesign of benches, etc., enables the worker to work with greater ease; he benefits from increased earnings and from the removal of many small irritations. And at the same time his employer profits by increased output. It is because of this fact that employers are prepared to finance the Institute's investigations: the improvements effected usually more than repay the cost. But the improving of the economic position of the concern is only one of the criteria which must be satisfied.

Of more special interest to readers of this Journal is the personnel work of the Institute. A special staff deals with the problems of staff selection, and tests have been devised, interviews planned, and rating scales drawn up for the selection of numerous types of employees, including engineers' apprentices, printers, compositors, dressmakers, weavers and spinners, wallpaper designers, salesmen, commercial travellers, clerks, shorthand typists, etc. The selection procedure is designed after a study and analysis of the work in each concern; the tests devised for, say, a spinning mill are not applied, complete, in another similar

mill unless it is found that the work performed by the various classes of operatives is the same in both. For usually the organisation of work, of supervision, etc., differs from works to works, so that qualities or abilities which are essential in one will be of relatively slight importance in another. It is difficult to obtain direct evidence of the improvement resulting from the use of the Institute's selection methods, but one firm has produced figures showing a reduction of labour turnover from twenty-eight to fifteen per cent a year. In another concern "apprentices and juniors are now capable of doing work which hitherto was done exclusively by seniors"; while a third states "we have definitely proved that the tests give us, within an hour, a measure of the boy's suitability (as an engineering apprentice) which it would take three to six months to obtain in the works under the control of a foreman." The Institute has many such testimonials among its records.

Such general personnel problems as recruitment, training, staff follow-up, transfer and promotions have also been successfully studied. Means have been devised for improving morale, for remodelling the relation between the various grades of operatives and management, and for dealing with the many subtle problems which arise from the interactions of human beings. The Institute has had the responsibility of organising staff control offices for a number of firms.

In vocational selection the Institute is concerned with choosing the best people for a given occupation: the work of its vocational guidance staff, on the other hand, is to decide the best

occupation for the individual who is being advised. The decision is based partly on test results,—intelligence, manual dexterity, literary ability, perception of form relations, etc., are tested;—and partly on an interview carefully planned to bring out the various temperamental and character traits in which the adviser is interested. Vocational inclinations and leisure occupations are explored, and school and university records are examined. After comparison of the results of this examination with occupation (job) analyses, the adviser is in a position to assess his subject's suitability for any career he may wish to adopt, and to advise him as to the work for which he is most suited. The need for this work is well shown by an analysis of a representative group of one hundred secondary school boys who had visited the Institute for guidance. Ten of them had no vocational inclinations. Of the remainder, forty-four—approximately fifty per cent—were definitely unfitted for the careers they had chosen. The value of the work is shown by the results of a follow-up of some of the first cases advised. Of a group of twenty-six from whom replies have been received, fourteen entered the occupations recommended; thirteen have made good progress, while the fourteenth states that the work is "not exactly interesting" but expects it to improve later. Of the twelve who did not take the advice, seven express definite dissatisfaction, three of them have since changed to work recommended and find it congenial, two are non-committal about their work, one is in a post not at variance with the report on him, and two are

satisfied in posts which the examination indicated as definitely unsuitable. But of this last pair one has changed very much, especially in self-assurance and "pushfulness," as a result of a nervous breakdown and subsequent treatment.

The Institute includes on its staff research workers engaged upon the investigation of more general problems. Reports have been published which give the results of the application of the methods of industrial psychology to farming, of tests of mechanical ability and of a study of the measurement of manual dexterities, while a description of a large-scale experiment on the value of vocational guidance is in preparation. An inquiry into the "mental make-up" of the higher business executive has recently been completed. Research in progress includes a second extensive experiment in the giving of vocational advice to elementary school children, the study of further problems of mechanical ability, the investigation of perseverance, of rhythm in motor activity, and of the possibility of testing for calmness under pressure of work. Further work is planned on tests for temperamental qualities, starting with those involved in "social ability."

Apart from the work already described, the Institute is responsible for

much educational work. Courses of lectures on Industrial Psychology are given in connection with the University of London, and arrangements have been made for similar courses to be given at the University of Glasgow by the Director of the Scottish Division of the Institute. The Institute's Library is proving of great value to students, some of whom are specially coached in its methods. A number of firms send members of their staffs from time to time for training in the methods of industrial psychology.

It is impossible in so short an article as this to deal comprehensively with the work of the Institute, and indeed almost every investigation it undertakes raises new problems for solution. There is hardly any corner of the industrial field into which it has not penetrated, hardly any branch of industrial activity in which it has not demonstrated the value of psychological study. The value of its work is best shown by the consistent growth of the activities of all its sections since its foundation. To quote only one measure of this, the fees received for investigations have steadily increased during the last five years from under £7,000 in the year 1925 to £162,400 in 1929.

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Personnel Books

Special Guidance Issue

EDITED BY DOUGLAS FRYER

This issue includes reviews of very nearly 50 recent books and pamphlets upon various phases of guidance. Vocational and educational guidance are emphasized. As Franklin J. Keller says in the leading review, "So far as the publishers are concerned, guidance has certainly caught up with the procession." The enormous volume of guidance material is best illustrated perhaps in the survey of "Sources of Vocational Information" by Harry D. Kitson. The personnel and guidance office has an enormous task in keeping vocationally up-to-date and the available sources of this occupational information are indicated here. "Briefer Mention" includes reviews upon broader guidance problems, as of mental hygiene and the colleges. An echo of controversy over the field of guidance as a vocation itself is brought to our attention by George E. Myers in his review of Jones' PRINCIPLES. The literature of today emphatically demonstrates that guidance is not only a healthy movement, but that its spirit has permeated nearly all forms of organized personnel activities. "New Books" includes in this issue those published during August and September.

WHAT SHOULD YOUNG PEOPLE KNOW ABOUT JOBS ?

PLANNING YOUR FUTURE. By Myers, Little and Robinson. New York: McGraw-Hill, 1930, x + 417 pp., \$1.50.

READINGS IN VOCATIONAL LIFE. By Howard C. Hill. Boston: Ginn, 1930, x + 640 pp., \$1.80.

A SOURCE BOOK FOR VOCATIONAL GUIDANCE. By Edna E. Watson. New York: Wilson, 1930, 241 pp., \$2.25.

Reviewed by FRANKLIN J. KELLER, *East Side Continuation School, N.Y.C.*

If every applicant for a job knew before he entered the door of the personnel department, just what kinds of jobs the firm had to order, was familiar with their advantages and disadvantages, and also had a fair idea as to which ones he would like or dislike, and had a moderate knowledge of occupational conditions in other businesses and industries—but why go on?—the personnel

manager would pinch himself all day—"This must be heaven." Yet with all sorts of limitations and reservations, it is just such information that a great many secondary schools are attempting to give their pupils. Vocational counselors act upon the assumption (we are talking about the good ones) that the individual boy or girl must ultimately make his or her own decision as

to employment, and, as in all other life situations, this decision can only be valid when based upon adequate information. At one time this information resided only in the minds of bosses and foremen. Later it gravitated into the offices of personnel managers. But it never penetrated the consciousness of the mere worker who had to live or die according to his adaptability to his work. Then vocational guidance came along to shock the traditional school man by insisting that a finished educational product might include in his arsenal for the battle of life a few weapons with which to meet the business and industrial conditions into which he would be thrown.

Eight or ten years ago when vocational guidance was just casting off its swaddling clothes and was beginning to walk, the need for more authentic information on occupations was felt. The favorite task of vocational counselors was to visit business organizations and manufacturing establishments to learn all about jobs and then to write them up into lessons for occupational information classes. Such material first appeared in mimeographed sheets for use in one school and later in the form of leaflets and pamphlets. Obviously this kind of investigation and research could not be effectively and economically carried on by isolated individuals for their own use, any more than each teacher could write his own history or civics text. So the demand soon evolved a supply and there appeared those pioneer volumes, Gowin and Wheatley's *OCCUPATIONS*, Weaver's *VOCATIONS FOR BOYS*, Giles *VOCATIONAL CIVICS*, and several others. Since that time such books have come from the press occasionally and have varied considerably in merit. Within the last year or so however, with the rapid spread of guidance courses in the secondary schools, there has been such an outpouring of classroom texts that an administrator who has to choose which he shall use, or whether he should use any at all, feels that he is in the same difficulties as with the numerous new "readers" and "arithmetics" which have always cluttered his desk. So far as the publishers are concerned, guidance has certainly caught up with the procession.

Among these very recent books I note: Cooley, Rodgers & Belman's *MY LIFE WORK*, a series of four books covering the "building and metal trades," "printing and servicing trades," "store and office occupations," and "representative industries." Other recent books are: Ralph P. Gallagher's *COURSES AND CAREERS*, May Rogers Lane's *VOCATIONS IN INDUSTRY*, William A. Proctor's *VOCATIONS*, Davis and Wright's *YOU AND YOUR JOB*, Smith and Blough's *PLANNING A CAREER*, Holbrook and McGregor's *OUR WORLD OF WORK*.

A reviewer ought to reveal to his readers those intimate incidents of his life which give a slant to his learned criticism. Here is one. Ten years ago, when I assumed charge of my present school, one of my first experiences was to enter a classroom where the pupils were using Weaver's old book and to hear something like this: "Angelo, you start reading about the work of the carpenter." Angelo stumbles over a paragraph and sits down. "Jimmy, you go on." Jimmy gets through the next section.—Well you know what happens. A live, up-to-date, wide-awake subject becomes deadly dull. In other words any text will be as valuable or useless as the teacher makes it. However, the better the book, the easier the teacher's task, and all power to those who are trying to put between the covers of a book the most vivid description of occupational conditions.

According to the aims of authors and the results they produce, these occupational books seem to fall into three types:

a. A straightforward, simple description of each major occupation, accompanied by pictures of men and women at work. Here the author relies upon the teacher to supply the teaching technique.

b. The same material as in "a" plus many general considerations on topics such as "Why plan your future?" "Why there are different kinds of work and what they are," "Finding a job," and "The first days in a new job." In addition, the author indicates the teaching technique by suggesting "Questions to answer and things to do," and lists "Books to read."

c. The author selects from existing literature readings on various phases of

vocational life and groups them according to larger topics such as "Earning a living," "Saving and thriving," "Buying and selling," and "Succeeding in one's work." The readings usually have some literary value and presumably are attractive to children for elements other than the content.

Myers, Little and Robinson's book illustrates the second type. It attempts at each point to challenge the pupil's thought and not merely to state facts. Wherever possible it relates these facts to the probable experiences of the reader. It gives the pupils many and various things to do, and unquestionably the more they *do* and the less they attempt to absorb passively, the greater the benefit to them. The book is designed for use in junior high school grades. The proof of its effectiveness is in its use, but it has the earmarks of a most valuable text. The name of Professor Myers lends color to this throughout for his *PROBLEM OF VOCATIONAL GUIDANCE* has proved a most useful book in its own field.

Hill's *READINGS IN VOCATIONAL LIFE* is a voluminous work in the third group. It reveals a catholicity of taste and, skillfully used as supplementary material, should inspire many a youngster. "Skillfully used"

means that little or nothing should be assigned, but that much should be suggested. The book must make its own way in the young reader's hands.

Miss Watson's *SOURCE BOOK FOR VOCATIONAL GUIDANCE* (again of the third type) grows out of her most excellent work in the Baltimore schools. Those who have observed her know that the material is effective in her hands and can be made so by others if good methods are used. The first section contains "Inspirational Material." Much of this, such as, Elbert Hubbard's *A MESSAGE TO GARCIA*, and Frank Crane's *BOY WANTED* is familiar and in its place, useful. The greater part of the book lists the major occupations (and a few top-flight ones much as Admiral and Bishop) and under each gives in addition to an inspirational selection, a valuable list of biographies, poems, short stories, and magazine articles.

The teacher of occupations must not be confused by this wealth of books on vocations. There need be no difficulty in choosing. Get a few copies of each. Let the youngsters do things with them. Call it research if you like. All of the books will probably prove valuable in one way or another.

MORE ABOUT OCCUPATIONAL STUDY

PLANNING A CAREER. By Smith and Blough. New York: American Book, 1929, x + 470 pp.

THE MANUAL OF OCCUPATIONS. By Ruth-erford Platt. New York: Putnam's, 1929, viii + 477 pp.

Reviewed by DON H. TAYLOR, *New York University*

The increasing tendency to use courses in "occupations" in junior and senior high schools as a method of disseminating vocational information has made popular and lucrative the preparation of "textbooks" for such classes.

The volume by Smith and Blough is representative of the large number which have appeared in the last two or three years. There is a preliminary statement on the value of an education, citing again the apparently nine-lived wage-worth of school training myth which should long since have

achieved a decent burial. Occupations are discussed under the nine general heads employed in the United States census classification and opportunities for men and women are described separately.

The book is well within the comprehension of boys and girls of junior high school age and the illustrations are frequent and effective. In other words, it can best be described as "another" textbook for a junior high school class in occupations, unique neither in content nor manner of presentation.

The Manual of Occupations is *The Book of Opportunity*, with new cover and jacket blurb, which was reviewed so entertainingly by Max Freyd in the *PERSONNEL JOURNAL* for December, 1927. The amusement it

affords may justify a new edition; certainly as a practical description of occupations it has little value for the vocational counselor or personnel worker.

OUR WORLD OF WORK. By Harold L. Holbrook and A. Laura McGregor. New York: Allyn and Bacon, 1929, xi + 351 pp.

Reviewed by DANA Z. ECKERT

The vocational counselor or the teacher who has charge of a course on Occupations will find an excellent addition to the text material in this field in "Our World of Work" by Holbrook and McGregor. Edited by James M. Glass, the book gives evidence of workmanship at the hands of three people who know Guidance and who also know the junior high school and its needs.

The book does not pretend to describe all of the 572 groups of occupations listed by the Census Bureau but it does give children a basis for classifying any occupation in terms of five large fields and of three training levels. To aid in understanding such a classification typical vocations are discussed and illustrated with numerous pictures. The index lists about 160 pages containing half-tone reproductions of photographs and many of the pages have two such pictures. Visual aids in learning are thus utilized to the fullest extent.

The authors have inserted a number of short biographies which serve to add human and personal interest to the discussions. These biographies are not built on the "Alger theme," and they do in most cases show how persons who achieved rose in succession from the little-skill level through

the skilled level to the science or professional level. There is a constant emphasis upon the need for training and education in order to reach the more desirable levels in any field of occupations.

One of the most important elements in the book, from the standpoint of the teacher, is the series of study directions, plans for a scrap-book and questions for individual research. The efforts of the pupil are thus engaged in further investigation of certain occupations and he is given a method whereby he may evaluate any given vocation.

The book is one which will repay a careful examination on the part of any teacher or principal who is looking for a new text for a course in "Occupations." There are other books which contain more detailed outlines of occupations, but it is doubtful whether any text written for junior high school pupils comes nearer to meeting the vocabulary level of these grades. The simple language of the book is in itself a noteworthy achievement and should commend it for class-room use. In schools where other texts are now in use it will prove a valuable addition to the reference shelf.

WITH THE PSYCHOLOGIST AS HELMSMAN

PILOTING YOUR LIFE. By Joseph Jastrow. New York: Greenberg, 1930, xvi + 372 pp., \$3.50.

Reviewed by JOSEPH V. HANNA, *New York University*

Each individual is to be his own pilot, but will rely on the psychologist as helmsman on occasion. Under the heading, "Passengers and Cargo," points of view on the mental hygiene of childhood are offered,

along with a rather pointed generalization on sex-differences and important social, vocational and other implications which these differences involve, etc. Factors of heredity and environment, making for

individual differences, are dealt with under the heading "Equipment," "Rocks and Reefs" of mental navigation are neurotic and other abnormal and undesirable traits. "Guides to Navigation" constitute principles and practices of proper mental hygiene, work habits, sense of humor, happiness through correct adjustment, etc. The necessity of "mental landmarks" through the cultivation of proper attitudes, the avoidance of popular character readings, occultism, etc., is appropriately dwelt upon. The dangers in accepting extreme behaviorism, as pointed out by the writer, would seem to conform to sane psychological opinion. Extreme emphasis on speed at the expense of quality, our uncritical acceptance of exaggerated and superficial advertising, and the like, assume a rightful place in the author's treatment. The closing pages of the book deal with the importance of convictions, standards, loyalties, etc., essential to the well-ordered life.

With much of the material in the book the reader will find himself in general agreement. Some points of view, however, the

critical reader will find it difficult to accept. In explaining differences between the sexes, and among individuals of the same family, the author emphasizes hereditary factors to an extent unacceptable to students of behavior. Likewise, in analyzing the neurotic individual relatively too great emphasis would seem to be placed on inherited equipment, and too little on subtle conditioning factors in the environment. The inappropriateness of such general considerations as the psychology of national prohibition, and the recognition by intuitive processes, on the part of the few, of those rare souls, whom the author refers to as "uncommon clay," will be felt by the reader who is oriented to the general organization of the book. The psychologist (helmsman) at times assumes the not wholly inappropriate rôles of philosopher and crusader which add to his complicated duties as helmsman.

From the standpoints of richness of analogy, interesting style, and scholarly presentation, the author measures well up to standards set in previous works. The book, as a whole, merits careful reading.

JONES RAISES A QUESTION OF PRINCIPLE

PRINCIPLES OF GUIDANCE. By Arthur J. Jones. McGraw-Hill, 1930, xxiv + 385 pp., \$3.00.

Reviewed by GEORGE E. MYERS, *University of Michigan*

As stated in the preface, "this book has been written with the purpose of making clear the real meaning and significance of guidance, especially as it is related to the public schools." Its aim is to emphasize principles rather than procedures and practices. It seeks "to give a conception of guidance which will enable teachers and administrators to see the relation of guidance to other phases of education and thus form a basis for proper evaluation of procedures and practices."

Its point of view is that youth needs guidance in relation to all of the activities of life and not in relation to vocational activities only; that the public school must assume the major responsibility for this

broader type of guidance; and that reorganization of school work is necessary in order that youth may receive this much needed help.

The plan followed by the author is to present in Part I (64 pages) the meaning, purpose, and aim of guidance; in Part II (186 pages) methods of investigation in guidance; in Part III (108 pages) methods of guiding students and the organization of guidance; and in Part IV (8 pages) the results of guidance.

An outstanding feature of the book is the wealth of material which it contains concerning methods of studying the individual. A total of 133 pages, more than one-third of the book, is devoted to this

subject with such chapter headings as "The Use of School Records in Studying the Individual;" "Variability and Flexibility of School Organization as Aids;" "Try-out and Exploratory Activities;" "The Use of Tests;" "Estimates of Personality Traits;" "The Psychiatrist and Visiting Teacher;" "Astrology, Phrenology, Physiognomy, and Allied Methods;" and "Methods of Recording the Results of Investigations of the Individual."

One criticism which may be offered is that, full as it is of valuable material, the book seems likely to contribute to that very dissipation of the guidance movement which its author warns against when he says:

"There is real danger that the movement will become so broad as to be practically meaningless and dissipate itself into the thin air of general education or of general instruction." (p. 369). Through many pages I found myself asking, "Is not this general education? Why call it guidance?" On the other hand, pioneers in the guidance movement, while standing strongly for the specialized character of vocational guidance, will welcome Dr. Jones's emphasis upon the fact that this is an undertaking in which the entire school staff should have a part and wish him success in his efforts to inject more of the guidance attitude and spirit into general education.

GUIDANCE PROSE

PRINCIPLES AND PRACTICES OF VOCATIONAL GUIDANCE. By I. David Cohen. New York: Century, 1929, xxii + 471 pp.

Reviewed by WILLIAM M. PROCTOR, *Stanford University*

This book presents a very complete treatment of vocational guidance. There is an abundance of concrete factual material. The graphs and charts are admirably suited to illustrate the data presented, and the research questions at the end of each chapter are suggestive and stimulating. Every aspect of the problems connected with vocational choice, vocational training, and vocational adjustment is covered.

From the standpoint of the vocational counselor there is an excellent discussion of methods of presenting occupational information, the technique of counseling and the administrative organization of vocational guidance in a school or school system.

The book is written almost entirely from the vocational guidance side, with very little attention given to educational or other aspects of guidance. On this account it will be most helpful to those who are dealing with part-time continuation groups of students and with employed young people who need help in readjusting their vocational plans.

In general it may be said that within the rather narrow limits selected for treatment the author has accomplished a very satisfactory piece of work, which will be found to be a real contribution to the literature of vocational guidance.

SOURCES OF VOCATIONAL INFORMATION

Reviews by HARRY D. KITSON, *Columbia University*

I

Books and pamphlets prepared to place in the hands of those desiring vocational information.

OSTEOPATHY, OPPORTUNITIES FOR THE BLIND IN TRAINING AND PRACTICE. By

Lela T. Brown. New York: Am. Fd. for the Blind, 1929, 50 pp., \$.50.

STAND CONCESSIONS, AS OPERATED BY THE BLIND IN THE UNITED STATES AND CANADA. By Lela T. Brown. New York: Am. Fd. for the Blind, 1930, 71 pp., \$.50.

Publications issued for the enlightenment of the blind regarding vocational opportunities open to them. The pamphlet on Stand Concessions was based on a study of the vocational histories of fifty blind concessionaires who operate news stands, tobacco and confectionery stands. The pamphlet on Osteopathy was based on information secured from 56 (of 90 to whom questionnaires were sent) blind osteopaths, supplemented by information furnished by officers of the American Osteopathic Association.

THE PROFESSION OF NURSING. By Ruth Houlton. Minneapolis: Woman's Ocptl. Bur., 1930, 10 pp., 10¢.

LIBRARY WORK AS A PROFESSION. By Gratia A. Countryman. Minneapolis: Woman's Ocptl. Bur., 1930, 8 pp., 10¢.

These are pamphlets describing the conditions of work in the occupations of nurse and librarian.

MY LIFE WORK. By Robert L. Cooley, Robert H. Rodgers, and Harry S. Belman. New York: McGraw-Hill, 1930. Four Parts: Printing and Service Trades, vii + 167; Representative Industries, vii + 241; Building and Metal Trades, vii + 218; Office and Store Occupations, vii + 153, \$1.50 to \$1.75 ea.

Each of these books gives a survey of the leading occupations found in the field to which it is devoted; covering the duties, promotional steps, educational requirements, etc. Planned for students in classes on Occupations, especially in connection with try-out courses or courses in continuation and vocational schools.

OPPORTUNITY AHEAD! By Clayton H. Ernst and Trentwell M. White (Editors). New York: Appleton, 1929, vi + 188 pp., \$1.50.

A description of ten occupations that are attracting young men: Aviation, radio, teaching, the ministry, librarianship, the navy, the army, insurance, the stage, detective service. Each is written by an expert in the field who has tried to answer the questions regarding present openings, future opportunities, earnings, how to prepare for and where to obtain training. Since the chapters answer these questions more clearly than most books of this type, it is evident that the editors, one of whom is editor of *The Open Road for Boys*, exercised careful supervision of the work.

THE COUNTRY NEWSPAPER AND ITS OPERATION. By James C. Safley. New York: Appleton, 1930, x + 390 pp., \$3.00.

A discussion of newspaper work in general and of the particular questions confronting one who expects to run a country newspaper. Topics follow the traditional sequence found in most textbooks on newspaper work.

II

Books and pamphlets prepared for use in vocational instruction, but also useful as sources of vocational information in the personnel and counsel office.

INTRODUCTION TO MODERN JOURNALISM. By Stewart Robertson. New York: Prentice Hall, 1930, vi + 339 pp., \$2.50.

The book gives the rules and principles underlying the craft of the journalist. More than half of the book is devoted to news stories for purposes of illustration. It is intended as a text-book in courses in journalism.

MODERN SHOP PRACTICE. By H. M. Raymond (Editor-in-Chief) and thirty-three authorities. Chicago: Am. Tech. Soc., 1929 (12th Edition Revised), 7 vol., 2619 pp.

Practical information of both simple and complex operations in machine shop work, mechanical drawing, welding, metallurgy, machine drawing, forging, foundry work,

machine shop management, practical mathematics, practical physics, tool-making, tool design, pattern-making, dies and sheet-metal stamping, and blueprint reading for the machine trades. A library of text-books.

PRINCIPLES OF WOODWORKING. By Herman Iljorth. Milwaukee: Bruce Pub. Co., 1930, x + 207 pp.

A text intended not only for the use of students in secondary and vocational schools, but also for adults who have taken up the study and practice of woodworking as a hobby. It describes and shows the uses and care of tools; explains processes of manufacture. Contains a number of projects accompanied by working drawings and full instructions.

PHOTOGRAPHIC PICTORIALISM. By F. C. Tilney. Boston: Am. Photo. Pub. Co., 1930, ix + 218 pp., \$5.00.

The principles of photography are pounded under about seventy-five heads such as Aerial Perspective, balance, Chiaroscuro, gradation, recession, silhouette, concerning skies, etc. An interesting glimpse of future possibilities is given under the head of Colored Photography. Illustrated by about seventy-five beautiful plates.

THE STUDENT'S HISTORY OF PRINTING. By Merritt Way Haynes. New York: McGraw-Hill, 1930, xiii + 118 pp.

This book is an effort to give to the student, the apprentice and young worker in printing a sourcebook written in chronological form, giving the outstanding and significant events, showing the beginnings and development of the printing industry in all its phases.

EVERYDAY ARITHMETIC FOR PRINTERS. By John E. Mansfield. New York: McGraw-Hill, 1930, 130 pp., \$1.50.

This book has been prepared for the student of printing and for general use in schools and printer's apprentices. The problems involved cover all the arithmetical computations applied to the general and technical applications of mathematics to the printing industry.

AIRPLANE WELDING. By J. B. Johnson. Chicago: The Goodheart-Willcox Co., 1929, 321 pp.

This book is written primarily as a handbook of information for students and mechanics in aviation, covering such topics as, Methods of Joining, Equipment and Various Methods of Welds, Design and Construction of Welding Jigs, The Design of Welds, Welding of Aluminum and Special Materials, and the Inspection of Finished Welds, applying the general principles of welding to a practically new industry. It is filled with good clear-cut illustrations showing in detail how to do many of the various steps necessary in welding, and is written, so far as possible, in non-technical language. It contains many appendices, giving special information in chart form and in tables.

BUSINESS COMMUNICATION. By Carl Lewis Altmaier. New York: Macmillan, 1930, xv + 496 pp., \$1.80.

This is the third edition, revised, of a textbook in business correspondence which was first written in 1904. "The working material of the book comprises sixteen preliminary exercises; forty-three cases; fifty problems; and questions which every well-trained office assistant should be able to answer. The 'cases' are representative forms and letters from the files of well-known business houses, and illustrate differences in technique and in methods of handling business problems." In addition to the usual treatment of various kinds of letters, chapters are devoted to communication by telegraph, telephone, cable and radio.

PRINCIPLES OF REAL ESTATE PRACTICE. By Roger B. Washburn. New York: McGraw-Hill, 1930, xi + 625 pp., \$5.00.

In Part I the author presents the essentials of the real estate business: Office organization, salesmanship, advertising, insurance, and renting and leasing problems. In Part II he describes each of the various classes of property: Residences, apartment houses, land development, resort property, farms and country estates, business property, office buildings and industrial

property. In Part III he discusses the problems of regulating, zoning, taxing, and appraising real estate. Part IV discusses

legal considerations. The book is intended to be used as a text in a course in Real Estate.

III

Studies of changing occupational conditions offering useful information for the personnel and vocational office.

TRENDS OF LOCATION IN THE WOMEN'S CLOTHING INDUSTRY. By Mabel A. Magee. Chicago: U. of Chi. Press, 1930, xxiv + 175 pp., \$2.00.

A brief history of the industry (1859-1925) with special attention paid to trends of location (since 1889), nationally and regionally in cities. It shows the specialization that has grown up in various cities and the peculiar advantage of each community. Thirty-six charts, 30 maps and 53 tables.

THE VISITING TEACHER AT WORK. By Jane F. Culbert. New York: Commonwealth Fund, 1929, xv + 235 pp.

This book is based on the experience and accumulated data of visiting teachers in thirty communities especially selected for demonstrations of work under varied economic and industrial conditions in different parts of the country, and in a great variety of school situations. The book presents the main principles of procedure which visiting teachers have found applicable with reference to problems presented by various types of pupils, parents and teachers. Coöperation with outside agencies is also stressed. The section on Professional Preparation will give some guidance to prospective visiting teachers. The appendix contains sample case records and an Annual Report Bibliography.

HOME ECONOMICS TEACHER TRAINING UNDER THE SMITH-HUGHES ACT, 1917-1927. By Gladys Alee Branegan. New York: T. C., Columbia Univ. (Cont. to Educ., No. 350), 1929, viii + 159 pp., \$1.75.

A survey of the status of the preparation offered to prospective teachers of Home Economics in institutions recommended by

the various State Boards of Vocational Education and approved by the Federal Board for Vocational Education (numbering 71). The study covers the period 1917-27. A brief history of developments prior to 1917 is given, showing when home economics courses were introduced in various institutions, citing legislation on the part of the Federal government and states, and support rendered by such organizations as the National Society for the Promotion of Industrial Education. The investigation made by the author shows the growth with respect to number of courses, students, equipment, and appropriations, number of teachers and standards.

TRENDS AND NEEDS IN HOME MANAGEMENT.

By Helen Elizabeth Judy. New York: T. C., Columbia Univ. (Cont. to Educ. No. 365), 1929, viii + 128 pp., \$1.50.

One of the important phases of Home Economics is Home Management. Courses in this subject have been in a chaotic condition. The investigation here published attempts to show their condition. Conditions were examined through a questionnaire sent to one hundred institutions which offer a four year course in Home Economics. Sixty-eight replies were received. The inquiry covered the training and experience which teachers of these courses had enjoyed; amount of time devoted to the course in Home Management; prerequisites, aims and objections, content. In connection with the three last mentioned topics a "jury" consisting of ten experts was asked to vote on the most desirable practices. Their judgments are compared with past and present practices.

A HISTORY OF WOMEN'S EDUCATION IN THE UNITED STATES. By Thomas Woody.

New York: Science Press, 1929, Vol. I: xv + 608 pp., Vol. II, xii + 646 pp., \$10.00.

This book covers the changes that have occurred in the position of women from early times to the present. Naturally the greatest attention is devoted to the development of facilities for the education of women in the United States. All types of schools are treated: Female seminaries, girls' high schools, and women's colleges and higher professional schools. Chapters are also devoted to vocational education for women, physical education, woman's club movement, etc. The book is profusely illustrated. An interesting item in the Appendix is a list of textbooks mentioned in the catalogs of women's colleges since 1850. Bibliography.

HISTORY OF NURSING AND SOCIOLOGY. By M. P. Leonard. Bridgeport: Brewer-Colgan Co., 277 pp., \$3.00.

The book is in two parts, the first written by a Sister of Charity; the second (on sociology) by Frederick J. Russell. After describing early efforts made by Catholic orders, the author gives dates when various schools of nursing in the United States were established, dates of important scientific discoveries bearing on nursing; cites the influence of wars, national organizations, laws, etc. A section entitled Self-Examination, contains 212 questions on the history of nursing. The section on Sociology describes the position of the Catholic Church on a variety of problems mostly social: woman and the family, double standards, legislation for women, hypnotism, evolution, spiritism.

IV

General books and pamphlets useful as source books of vocational information in the personnel and vocational office.

TRADE TRAINING IN SCHOOL AND PLANT.

By Herman S. Hall. New York: Century, 1930, xxiii + 500 pp., \$3.00.

This book is a presentation of principles and methods involved in teaching the trades. Especial stress is laid on Trade analysis and organization of instructional units. It is illustrated by many photographs and forms for use by the teacher.

BUSINESS LAW. By E. S. Wolaver. New York: McGraw-Hill, 1930, xii + 461 pp., \$7.50.

About 250 cases classified under such headings as Nature of Offers, Options, Acceptance, Indemnity and Guaranty, Security of Transactions, Negotiability, Documents of Title, Partnership, etc. . . . The author is interested not so much in teaching elements of law as in presenting to students of business the fundamental legal doctrines and principles that must be considered in all commercial operations, to the end that the function of law in business may be analyzed and understood.

SALESMANSHIP FOR THE NEW ERA. By Charles W. Mears. New York: Harper, 1929, 229 pp.

A treatment of the sale under the usual headings of means of marketing; approach; attention; persuasion, closing, etc. Copious examples are given.

THE OFFICE AND TOMORROW'S BUSINESS.

By L. C. Walker. New York: Century, 1930, xi + 187 pp., \$1.50.

A book for higher executives who are interested in the philosophy of office work; and for office executives who are interested in the techniques of management. Questions treated are expense budgets, layout, routine, forms and records, mechanical devices, files, measurements of efficiency, morale, (to be engendered by giving employees "news" about the concern), stabilizing work and employment. A number of drawings illustrate principles of office layout.

METEOROLOGY FOR AVIATOR AND LAYMAN.

Richard Whatham. New York: Stokes, 1930, xvi + 179 pp., \$3.00.

This book, as its title indicates, would prove valuable to any aviator and interesting and educational to anyone living in this air-minded generation. It is written in clear, simple style, well outlined under

specific headings and with questions at the end of many of the chapters. Composition, structure and general circulation of the atmosphere, cloud formations, thunderstorms and cyclones are some of the weather conditions described in detail and well illustrated. Meteorological instruments used in recording and forecasting weather conditions are listed with explanation of what each one records. The book also contains a sensibly written chapter on forecasting the weather, temperature changes and strong winds. A list of meteorological stations is given.

PROBLEMS IN METALWORK. By John B. Butler. Peoria, Illinois: Manual Arts Press, 1929, 136 pp., \$2.50.

A practical book for the teacher of metal work. The first part of the book contains general information pertinent to the organization and equipment of a metal shop, an explanation of the jobs, and of the methods used in teaching metalwork. The second part of the book contains a series of individual instruction sheets showing how to make various articles in metal work: How to Make a Trowel, Whisk Broom Holder, Hammered Copper Ash Tray, Auto Drip Pan, Scoop, Flower Box, Tool Box, etc.

FORMATIVE IDEAS IN THE Y. M. C. A. By Paul Super. New York: Association Press, 1929, \$3.00.

The author was led to write this book by a remark of Herbert Hoover to the effect that the Y. M. C. A. embodies certain great ideas. These ideas the author has tried to locate. As finally grouped they are:

- (1) Ideas as to central objective and characteristic (e.g., building of character, prevention of errors, loyalty to the Christian religion and the church;
- (2) Ideas as to the field of work (e.g., boys as well as men, country districts as well as cities);
- (3) The educational group of ideas (e.g., formal curricula, thrift, sex, physical);
- (4) The social service group of ideas (e.g., use of leisure, cooperation with agencies in community, race problems);
- (5) The group of ideas as to organization (e.g., membership theory and practice; regional groupings);
- (6) Ideas as to relations to other institutions;
- (7) The controlling financial ideas;
- (8) Ideas as to general method.

Briefer Mention

THE TECHNIQUE OF STUDY. By Claude C. Crawford. New York: Houghton Mifflin, 1928, vii + 353 pp., \$2.00.

A revision of the book published by the author in 1926 under the title *Method of Study*. The topics include: Selecting Courses; Taking Notes; Listening to Lectures; Using Textbooks; Acquiring Skill, Memorizing; Thinking; Developing Interest; Building a Vocabulary; Using the Library; Preparing Papers; Reviewing; Taking Tests; Working in the Laboratory. Emphasis is laid on materials which answer the question *How*. A final chapter, "Teaching Study Habits" is directed to teachers. At the end of each chapter are given readings, exercises and a hundred or more questions of the short answer type.

WHICH COLLEGE? By Rita Halle. New York: Macmillan, 1928, xx + 268 pp.

This is a new printing of this deservedly popular work. Four chapters are devoted to general questions: Which College? How to Get There; The Junior College; After College—What? Then follow chapters describing colleges for men, colleges for women and coeducational colleges. Facts are given showing the number of students, number on the faculty, endowment, physical equipment, credit point requirements; tuition and living fees, degrees conferred.

GOING TO COLLEGE. By William C. Spicer. Boston: Stratford, 1930, 34 pp., \$1.00.

Personal advice from an older man to college freshmen about many things, among

them, choice of companions, college customs, fraternities, girls, religion, and so on. About girls the advice is "Don't get too serious." About religion, "Be the Captain of your own soul, whatever others may think or say." In general, "Be yourself" and "make college life give you what you started out to get."

ENERGIZING PERSONALITY. PERSONAL DEVELOPMENT THROUGH SELF-ANALYSIS. By Ancil T. Brown. New York: McGraw-Hill, 1929, xvi + 156 pp.

The author, for sixteen years an employment interviewer, *tells* the young man how to get on in the world. A plan of self-analysis is offered him. The vocations of advertising, architecture, personnel work, and thirteen other similar ones are described for his benefit. He is advised to get ahead by sticking to his job. Honesty, integrity, and industry are the virtues by which he will attain. In quotations, the business ideals of John Wanamaker, B. C. Forbes, Benjamin Franklin, Theodore Roosevelt, and others are brought to his attention.

COURSES AND CAREERS. By Ralph P. Gallagher. New York: Harper's, 1930, xxi + 394 pp., \$1.40.

This book is especially adapted for Junior High School use. Mr. Gallagher successfully develops his five main objectives, viz; selection of materials; presentation of common case; group organization; a set-up to give basic facts but to encourage original investigation; and allowance for flexibility to meet group and individual differences. Model lessons are included. Plans for self-analysis by students and references to reading on various occupations are also furnished. Students are encouraged to evaluate general education and the specific subjects in the curriculum. General requirements for trades and professions and, better still, a study of opportunities and the "first job" are ably handled.

GUIDING THE CHILD, ON THE PRINCIPLES OF INDIVIDUAL PSYCHOLOGY. By Alfred Adler and Associates. New York: Greenberg, 1930, viii + 268 pp., \$3.00.

Under the leadership of Dr. Alfred Adler a group of physicians and educators have in the last few years organized twenty-eight child guidance clinics in Vienna, Berlin and Munich. This book is the result of some of the experience gained in working in these clinics with the child and with the parent, along the lines of individual psychology. Topics covered include: the physician and educational guidance, when to refer children to the clinics, the family and educational guidance, the influence of individual psychology upon parents' associations, technique of guidance, etc. Problems of the child taken up in detail include rivalry, deaf-mutism, sex, the only child the hated child, etc. The working thesis of the clinics is that any child is capable of any task. The specialists find that the three classes which have greatest difficulty in adjusting to life are the only child, the hated child and the pampered child.

FOUNDATIONS OF MENTAL HEALTH. By Leonardo Bianchi. New York: Appleton, 1930, xvi + 277 pp., \$2.50.

This book was translated from the Italian and read by the author shortly before his death. The late professor of nervous and mental diseases in the Royal University of Naples was intensely occupied with problems of eugenics in a very wide sense. The eight chapters of this book are concerned with social conditions in their relation to mental inheritance, alcoholism and crime. The illustrations are chiefly drawn from Italy and the author's interpretation of data appears at times more fervent than logical. The book was written "to dislodge indifference to the momentous subject of eugenics, to lay open to the public conscience the dangers of bad habits and of certain defects of our present school system. . . . to fan the fires of the inexhaustible energies of our race which now lie sleeping under the ashes of inertness, of ignorance, and of old customs." It is obvious that eugenics is very widely interpreted by the author and that the English title is not representative of the contents.

PUBLIC EDUCATION AS AFFECTING THE ADJUSTMENT OF YOUTH TO LIFE. By

Nat'l. Indus. Conf. Bd. New York: 1929, xi + 61 pp., \$1.50.

This monograph is the result of a co-operative study of the existing maladjustments between education and industry. It was prepared by a group of educators and industrial leaders under the auspices of the National Industrial Conference Board. The attitude is taken, first, that we must look to economic conditions for an explanation of the changing status of the social order and the relation of the growing child to that order. Second, it is pointed out that we must look to the school to accomplish the necessary adjustments. The attempt is made to discover the true

responsibility of the school and not to lay at its door social conditions for which it is not responsible. The responsibility of industry to cooperate in solving the acute problems of public education in a changing world are clearly brought out. There is an especially strong analysis of the educational requirements of occupational fields, and of the values and methods of vocational education. Industry's part in these phases of education are also indicated. Some important and immediate issues in the field of personnel practice are raised, but the primary emphasis of the book is upon the ultimate outcomes rather than immediate results in the fields of cooperative research and vocational education.

New Books

LABOR RELATIONS

ESCAPE FROM THE "DOLE;" UNEMPLOYMENT INSURANCE OR EMPLOYMENT ASSURANCE? By A. S. Comyns Carr. London: Faber, 1930, 38 pp., 2s.

LABOUR ORGANIZATION. By James Cunneison. New York: Pitman, 1930, 279 pp., \$2.25.

SLAVERY AGITATION IN VIRGINIA, 1829-1832. By Theodore M. Whitfield. Baltimore: Johns Hopkins Press, 1930, 170 pp., \$1.75.

THE PERSONAL RELATION IN INDUSTRY. By John D. Rockefeller, Jr. New York: Boni, 1930, 149 pp., 50¢.

OCCUPATIONAL ANALYSIS

TRENDS IN EDUCATIONAL OCCUPATIONS; AN EXAMINATION OF THE WAXING AND WANING OCCUPATIONS IN THE PUBLIC SCHOOL SYSTEMS OF CERTAIN CITIES IN THE UNITED STATES FROM 1898 to 1928. By Marjorie Rankin. New York: T. C. Columbia Univ., 1920, 83 pp., \$1.50.

VOCATIONAL INFORMATION

AVIATION AS A CAREER. By Joseph V. Hanna. New York: Kiwanis Club, 1930, 32 pp.

JOURNALISM AS A CAREER: PLAIN COUNSELS BY LEADING JOURNALISTS. By W. T.

Cranfield (ED). London: Pitman, 1930, 100 pp., 5s.

ORDER WORK FOR LIBRARIES. By Francis K. W. Drury. Chicago: Amer. Lib. Ass'n., 1930, 272 pp., \$2.25.

SOLDIERS OF PROGRESS AND INDUSTRY. By John R. Hornady. New York: Dodd, 1930, 250 pp., \$3.00.

THE BOYS' BOOK OF ANNAPOLIS. By George L. Knapp. New York: Dodd, 1930, 282 pp., \$2.00.

THE EVOLUTION OF THE FLYING MACHINE: BALLOON, AIRSHIP, AEROPLANE. By Harry Harper. Philadelphia: McKay, 1930, 288 pp., \$5.00.

THE MEDICAL CAREER: THE IDEALS, OPPORTUNITIES AND DIFFICULTIES OF THE OF THE MEDICAL PROFESSION (2d ed.). By Harvey W. Cushing. Hanover: Dartmouth Coll., 1930, 53 pp., \$1.00.

THE PRINTING OF ETCHINGS AND ENGRAVINGS. By David Strang. (Intro. by Martin Hardie). New York: Dodd, 1930, 228 pp., \$4.00.

WRITING FOR PROFIT. By Donald Wilhelm. New York: McGraw, 1930, 385 pp., \$3.00.

MENTAL TESTS AND USES

STUDIES ON SEASHORE'S "MEASURES OF MUSICAL TALENT." By Ruth C. Larson. Iowa City: U. of Iowa., 1930, 83 pp., 75¢.

THE PROGNOSTIC VALUES OF CERTAIN GROUPINGS OF THE TEST ELEMENTS OF THE THORNDIKE INTELLIGENCE EXAMINATION FOR HIGH SCHOOL GRADUATES. By David W. Lefever. Los Angeles: U. of So. Cal., 1930, 128 pp., \$1.25.

MANAGEMENT AND ADMINISTRATION

MACRAE'S BLUE BOOK (NATIONAL DIRECTORY OF MANUFACTURERS). Chicago: MacRae's Blue Book Co., 1930, 2500 pp., \$15.00.

PROBLEMS IN PUBLIC UTILITY MANAGEMENT (2d ed.). By Philip Cabot and Deane W. Malott. New York: McGraw-Hill, 1930, 632 pp., \$6.00.

THE ACCOMMODATION PROCESS IN INDUSTRY. By Melvin J. Vincent. Los Angeles: U. of So. Cal., 1930, 118 pp., \$1.25.

THE INDUSTRIAL HISTORY OF THE UNITED STATES. By Witt Bowden. New York: Adelphi, 1930, 521 pp., \$4.00.

WHAT'S WRONG WITH UNEMPLOYMENT INSURANCE. By Ronald C. Davison. New York: Longmans, 1930, 73 pp., \$1.00.

YEARLY STANDARDS OF PERFORMANCE FOR DEPARTMENT STORES: 1928-1929. By Edgar H. Gault. Ann Arbor: U. of Mich., 81 pp., \$1.00.

INDUSTRIAL EDUCATION

OUR EDUCATIONAL TASK, AS ILLUSTRATED IN THE CHANGING SOUTH. By William H. Kilpatrick. Chapel Hill: U. of N. C., 1930, 132 pp., \$1.50.

SUPERVISED STUDENT-TEACHING: BASIC PRINCIPLES ILLUSTRATED AND APPLIED STUDENT-TEACHING ACTIVITIES; AND ORGANIZATION AND ADMINISTRATION. By Arthur R. Mead. Richmond: Johnson, 1930, 913 pp., \$3.00.

THE AMERICAN ROAD TO CULTURE: A SOCIAL INTERPRETATION OF EDUCATION IN THE UNITED STATES. By George S. Counts. New York: Day, 1930, 207 pp., \$2.50.

PSYCHOLOGY

CHILD PSYCHOLOGY: THE KINDERGARTEN CHILD. VOL. 2, ITS CONCEPTION OF LIFE AND ITS MENTAL POWERS. VOL. 3, THOUGHT, IMAGINATION AND FEELING:

WILL AND MORALE. By Vilhelm Rasmussen. London: Gylndendal, 1930. 4s. to 5s. 6d.

CONDUCT PROBLEMS FOR JUNIOR-HIGH SCHOOL GRADES. By Elvin H. Fishback and Edwin A. Kirkpatrick. Boston: Heath, 1930, 64 pp.

KEEPING MENTALLY FIT: A GUIDE TO EVERYDAY PSYCHOLOGY. By Joseph Jastrow. New York: Garden City Pub., 1928, 315 pp., \$1.00.

PSYCHOLOGY OF SUCCESS. By Yacki Raitzoun. Milwaukee: Casper, 1930, 28 pp., 25¢.

PSYCHOPATHOLOGY: ITS DEVELOPMENT AND ITS PLACE IN MEDICINE (new and enl.). By Bernard Hart. London: Cambridge U., 1930, 178 pp., 8s. 6d.

STUDIES IN PHILOSOPHY AND PSYCHOLOGY. By George F. Stout. New York: Macmillan, 1930, 421 pp., \$4.50.

THE MEASUREMENT OF MAN. By J. A. Harris and others. Minneapolis: U. of Minn. Press, 1930, 222 pp., \$2.50.

THE MOTIVES OF MEN (new ed.). By George A. Coe. New York: Scribner, 1930, 275 pp., \$1.00.

THE PSYCHOLOGY OF INSANITY (4th ed.) By Bernard Hart. London: Cambridge U., 1930, 176 pp., 3s.

UNDERSTANDING HUMAN NATURE. By Alfred Adler (tr. by Walter Beran Wolfe). New York: Garden City Pub., 1927, 299 pp., \$1.00.

WHY WE BEHAVE LIKE HUMAN BEINGS (New Ed.). By George A. Dorsey. New York: Blue Ribbon Books, 1925, 526 pp., \$1.00.

WHY YOU WIN OR LOSE; THE PSYCHOLOGY OF SPECULATION. By Fred C. Kelly. Boston: Houghton, 1930, 177 pp., \$2.00.

ECONOMICS

AMERICAN ECONOMIC LIFE AND THE MEANS OF ITS IMPROVEMENT (3d. ed.) By Rexford G. Tugwell and others. New York: Harcourt, 1930, 746 pp., \$4.00.

BANKING RATIOS; A STUDY OF THE OPERATING RESULTS OF MEMBER BANKS WITH SPECIAL REFERENCE TO THE TWELFTH FEDERAL RESERVE DISTRICT AND TO CALIFORNIA. By Horace Secrist and Keith

- Powlson. Stanford U.: Stanford U. Press, 1930, 653 pp., \$10.00.
- ECONOMIC CONDITIONS IN CANADA. By Overseas Trade Dept. Report. London: H. M. S. C., 1930, 3s. 6d.
- ECONOMICS OF MODERN INDUSTRY: AN INTRODUCTION FOR BUSINESS STUDENTS. By Percy Ford. New York: Longmans, 1930, 256 pp., \$1.50.
- THE NATIONAL INCOME AND ITS PURCHASING POWER. By Willford I. King and Lillian Epstein. New York: Nat'l Bureau of Ec. Research, 1930, 394 pp., \$5.00.
- THE NATURAL ECONOMIC ORDER; A PLAN TO SECURE AN UNINTERRUPTED EXCHANGE OF THE PRODUCTS OF LABOR, FREE FROM BUREAUCRATIC INTERFERENCE, USURY AND EXPLOITATION. By Silvio Gesell. San Antonio: Free Ec. Pub., 1930, 392 pp. \$4.25.
- THE PROTESTANT ETHIC AND THE SPIRIT OF CAPITALISM. By Max Weber (tr. by Talcott Parsons). New York: Scribner, 1930, 303 pp., \$3.00.
- THE THEORY AND PRINCIPLES OF CENTRAL BANKING, WITH SPECIAL REFERENCE TO THE WORKING OF THE BANK OF ENGLAND AND OF THE FEDERAL RESERVE SYSTEM OF THE UNITED STATES. By William A. Shaw. New York: Pitman, 1930, 266 pp., \$3.75.

SOCIOLOGY

- CRIMINAL JUSTICE IN AMERICA. By Roscoe Pound. New York: Holt, 1930, 240 pp., \$2.00.
- INTELLIGENT PHILANTHROPY. By Ellsworth Faris, and others, (eds). Chicago: U. of Chicago, 1930, 329 pp., \$4.00.
- STATISTICS IN SOCIAL STUDIES. By Stuart A. Rice (ed.). Philadelphia: U. of Pa., 1930, 234 pp. \$3.00.
- THE NEW SOCIAL SCIENCE. By Leonard D. White (ed.). Chicago: U. of Chicago, 1930, 141 pp., \$1.50.
- THE SOCIAL AND POLITICAL IDEAS OF SOME GREAT FRENCH THINKERS OF THE AGE OF REASON. By Fossey J. C. Hearnshaw, (ed.). New York: Crofts, 1930, 251 pp., \$3.50.
- THE STORY OF PUNISHMENT: A RECORD OF MAN'S INHUMANITY TO MAN. By Harry E. Barnes. Boston: Stratford, 1930, 299 pp., \$3.00.

PHILOSOPHY

- GOD AND INTELLIGENCE IN MODERN PHILOSOPHY: A CRITICAL STUDY IN THE LIGHT OF THE PHILOSOPHY OF SAINT THOMAS. By Fulton J. Sheen, (Intro. by G. K. Chesterton). London: Longmans, 1930, 295 pp., 15s.

Current Periodicals

PREPARED BY LINDA H. MORLEY, *Industrial Relations Counsellors, Inc.*

ACCIDENTS—STATISTICS

HOMAN, S. W. (Assistant Director, Bureau of Industrial Standards). What size of plant is most hazardous? *Labor and Industry*, July, 1930, vol. 17, p. 4-5.

Summary of findings obtained by reports of 6069 establishments reporting 51,527 lost time accidents during 1929 tends to confirm assumption that accident frequency in establishments employing small number of persons is higher than in establishments employing larger number.

AGREEMENTS

United Mine Workers of America. New anthracite agreement. *United Mine Workers' Journal*, August 1, 1930, vol. 41, p. 3-4.

"Provides for maintenance of present wage rates and conditions and establishment of checkoff, and is for period of five years—ratification convention is to be held at Scranton."

BIOGRAPHY—BIBLIOGRAPHY

Russell Sage Foundation—Library. Leaders in social adventure. New York, August, 1930, 11 p. *Bulletin*, no. 102.

"Selected list of biographies and autobiographies of social workers, reformers, physicians, labor leaders and others interested and active in all forms of social service in the Russell Sage Foundation Library."

COLLEGE MEN IN BUSINESS

BELNAP, L. J. (President, Worthington Pump and Machinery Corporation, New York City). College man in industry. *Executives Service Bulletin*, September, 1930, Vol. 8, p. 1, 8.

"Organizing a program for selecting, training and absorbing recent engineering graduates."

COÖPERATION—BIBLIOGRAPHY

Coöperative movement—a selected bibliography. *Monthly Labor Review*, September, 1930, vol. 31, p. 782-801.

Covers only material published since March, 1925; for previous material see *Monthly Labor Review*, March, 1925, p. 201-232.

ECONOMICS

KUZNETS, SIMON (National Bureau of Economic Research). Static and dynamic economics. *American Economic Review*, September, 1930, vol. 20, p. 426-441.

Study of business cycles and the generally expanding study of economics at large has renewed the claim for dynamic economics which deals with changes of social phenomena in time, rather than static economics which decomposes the social phenomena into units of individual activity. Author hopes that from dynamic economics, the theory of change will gradually be evolved on a firm basis for judgments about the stable and unstable elements of our economic system.

EMPLOYMENT STATISTICS

CROXTON, FRED C. (Department of Industrial Relations, Ohio), and Croxton, Frederick E. Fluctuation of employment in automobile manufacturing and related industries in Ohio, 1923 to 1928. *Monthly Labor Review*, July, 1930, vol. 31, p. 40-47.

Conclusion shows that in manufacture of automobiles 11,055 fewer persons were employed in October than in May, 1923; 23,909 fewer in November than in March, 1924; 12,242 fewer in January than in May, 1925; 13,859 fewer in December than in June, 1926; 19,671 fewer in November than in April, 1927 and 20,738 fewer in January than in June, 1928. Similar

statistics are given for persons employed in manufacture of rubber tires and tubes, and those employed in garages and auto repair shops.

EXCHANGES

BOWERS, GLENN A. (Industrial Relations Counselors, Inc.) Employment service in the United States. *Law and Labor*, September, 1930, vol. 12, p. 198-203.

History of the employment agency service in the United States is traced through the period of slave trading and indentured service, up to the modern period which dates from 1890. The various types of agencies, privately operating fee-charging commercial, non-fee charging and public employment offices maintained by Federal government are described. Placement service seems to be in unsatisfactory stage, but with the popular interest in all phases of employment and proposals for better organization in the field, a decided improvement should result.

HOURS OF LABOR

Extension of continuous working week in industry. *Economic Review of the Soviet Union*, September 1, 1930, vol. 5, p. 352-353.

During the first half of the current year, 63 per cent of the total number of industrial workers in the Soviet Union were put on continuous working week basis, and the number of days during which factory operates was raised from average of 24 to 30 per month. Productivity of labor was also improved and in 18 out of 43 enterprises there were decreases in absences amounting to 60 per cent or more; although 25 showed increases in absences.

Laws relating to the Saturday half holiday. *Monthly Labor Review*, September, 1930, vol. 31, p. 619-621.

The Saturday half holiday is a legal holiday in about 25 per cent of the states. Chart is given for these states with the period of holiday, provisions applicable to and citation.

WINKEL, MAX G. 4-hour day—a possibility! *American Federationist*, September, 1930, vol. 37, p. 1093-1099.

Thinks reduction of working hours would be a simple matter if everyone realizes it can be done and cooperates to accomplish it. We work only in order to get necessities of life; that is, money is only valuable as a means of exchange. The amount of work we do must be in proportion to the amount of production necessary to satisfy our wants. Suggests that in order to reduce amount of work we must (1) make production easier and (2) prevent waste of goods already produced.

INCENTIVES

LANGSNER, ADOLPH (Chief Engineer and Superintendent, Eugene Dietzgen Company) Incentives, plain and fancy. *Factory and Industrial Management*, September, 1930, vol. 80, p. 527-528, 551.

Much of the data discussed in this article is the result of an extensive study of "Compensation Methods and Financial Incentive Plans," undertaken by author under auspices Northwestern University. Shows pronounced drift toward bonus in the plants investigated, as well as marked tendency away from the incentive frills of a dozen years ago.

INDEX NUMBERS

Pennsylvania—Labor and Industry Department—Statistics Bureau. Revised indexes of employment and wage payments in the construction and contracting industries in Pennsylvania. *Labor and Industry*, July, 1930, vol. 17, p. 21-23.

Indexes adjusted in 1929 with view to eliminating disturbing factors in index; decided to adjust indexes by weighting them in the proportion that the employment totals for the reporting concerns in three selected areas bore to the total number employed in contracting industries in those areas as determined by data reported in fourteenth census of the United States (volume on occupations). Methods used in computing tables of indexes also given.

INDUSTRIAL RELATIONS

Industrial review of the year, July, 1929 to July, 1930. *Information Service*, July 26, 1930, vol. 9, p. 1-7.

Includes a review of the economic depression, controversy over unemployment insurance, wages, hours and cost of living, maximum hiring ages, trade union memberships, industrial relations, labor legislation, and court decisions, including collective bargaining, strikes and restraint of Interstate Commerce.

INSURANCE

New French social insurance law. *Monthly Labor Review*, September, 1930, vol. 31, p. 623-639.

Describes the new law as it affects the two groups, the commercial, industrial and domestic workers, and the agricultural workers. Sick benefits, old-age insurance, guaranty during unemployment, etc. are included.

LABOR

KUMMER, FRITZ (Stuttgart). Labor conditions in the automobile industry in Germany. *Monthly Labor Review*, July, 1930, vol. 31, p. 29-33.

Statistics given to show number of motor vehicles produced between 1925 and 1928; number of workers employed; size of automobile plants and average hourly earnings of pieceworkers in automobile plants in Germany.

About 70.6 per cent of workers are organized.

LABOR DECISIONS

WITTE, EDWIN E. Social consequences of injunctions in labor disputes. *Illinois Law Review*, March, 1930, vol. 24, p. 772-785. (Abstract in *Social Science Abstracts*, August, 1930, vol. 2, p. 1343.)

Injunctions handicap the labor union, and make it harder to win strikes. More violence in labor disputes in the United States than in any other country. Persons arrested for violation of an injunction are usually charged with a criminal charge for an act of violence rather than contempt.

LABOR LEGISLATION

Labor legislation of 1929. *Monthly Labor Review*, August, 1930, vol. 31, p. 349-356.

Review for the year including contract of employment, employment agencies, group life insurance, hours of labor, child labor, safety and health, wages, mechanics' liens, small loans, cooperative organizations, holidays and days of rest, labor unions and disputes, pensions, vocational rehabilitation, vocational education, labor departments and investigative commissions.

LAYOFF

Lay-off and its prevention. *Industrial Relations News Letter*, September, 1930 vol. 2, p. 9-10.

Article deals with the various things American industry is doing about intermittent employment. The causes of variation in plant operating activity, the attempts to stabilize the working force and what has already been accomplished, are topics discussed.

LEADERSHIP

NAVE, R. W. Psychological description of leadership. *Journal of Social Psychology*, May, 1930, vol. 1, p. 248-265.

Attempt of department in Cornell University to make a psychological description of leadership. By examination of the facts which seem to lead to leadership, it seems to be dependent on the arousal of the emotional state which, in turn, is dependent on one's prior emotions and the coloration accompanying aspects of the situation. Hopes this knowledge of leadership may be stimulated and its development guided.

MACHINERY IN INDUSTRY

FOSDICK, RAYMOND B. Individualism in the machine age. *Wellesley Alumnae Magazine*, August, 1930, vol. 14, p. 396-398.

Certain phases of the individualism of Thoreau still have immediate bearing on this generation, although the machine age has transformed the function of the individual, and the tendency of today is

to submerge him in the mass, and to strengthen group life rather than the individual. Suggests to the members of the graduating class that to each person the opportunity comes as it did to Thoreau to choose between "the herbs and apples on one hand, and the other the kingdom, stars and sky that holds them all."

NURSING SERVICE

JOHNSON, ARTHUR S. Nurse can help in your safety program. *National Safety News*, August, 1930, vol. 22, p. 46, 48.

Both the industrial nurse and the safety engineer are working toward the same objective—fewer accidents and less severe injuries. Teamwork will accomplish this.

ORGANIZATION AND ADMINISTRATION

FIELD, C. Management of the small manufacturing plant, its characteristics and advantages. *American Society Mechanical Engineers, Advance Paper for Meeting*, June 9-12, 1930, 10 p. (Abstract in *Factory and Industrial Management*, August, 1930, vol. 80, p. 341.)

Having ascertained that small plants greatly predominate, paper suggests reason. Bibliography.

RAUTENSTRAUCH, WALTER (Professor of Industrial Engineering, Columbia University) Measuring management. *Bulletin of the Taylor Society*, August, 1930, vol. 15, p. 198-201.

Management in relation to industry is concerned with the growth of capital wealth and the growth of personalities into better members of the organization and the community. In measuring the economic aspects of management the constitution of the assets and liabilities of the business must be considered and a knowledge of the profit possibilities must be ascertained.

RESEARCH

LITTLE, ARTHUR D. (President, Arthur D. Little, Inc., Cambridge, Mass.) Value of technological research. *Executives Service Bulletin*, September, 1930, vol. 8, p. 3-4.

"Applying the scientific method to the problems of management to keep abreast of progress."

Students' dissertations in sociology. *American Journal of Sociology*, July, 1930, vol. 36, p. 81-111.

List of doctoral dissertations and masters theses in preparation in universities and colleges in the United States and Canada. It is a compilation of the returns from letters sent by editors of the *American Journal of Sociology* to the departments of sociology. It includes dates and probable year when degree will be given.

SAFETY

CHAMBERS, E. G., (M. A., Investigator for the Industrial Health Research Board, London) Personal qualities in accident causation. *Journal of Industrial Hygiene*, June, 1930, vol. 12, p. 223-232.

"That individuals differ in their proneness to accidents has been established beyond doubt, and it has been further shown that certain measurable psychologic functions play a definite part in this proneness. Tests have been found which when combined with entrance examination of apprentices to a skilled trade, correlate more highly with accident proneness than does the entrance examination alone . . . and also more highly with industrial efficiency."

SALARIES

HURLIN, RALPH G. (Department of Statistics, Russell Sage Foundation) Salaries in family case work in 1929. *Family*, July, 1930, vol. 11, p. 139-148.

Studies of salaries paid by member agencies of Russell Sage Foundation. Salaries reported by 260 agencies used. In comparison it was found Jewish organizations paid higher salaries; men's executive salaries were higher than women's executive salaries and men case workers' salaries were about the same as women. Most typical salary for case workers was \$1,500 and for workers in training \$1,200 seemed average.

SKILL

GILBRETH, LILLIAN M. (Industrial Engineer) Skills and satisfactions. *Trained Men*, Autumn, 1930, vol. 10, p. 99-102, 113.

"Has too much attention been given to the things made, and the pay the worker receives, rather than to the ultimate satisfactions of skill?"

STABILIZATION OF EMPLOYMENT

BEIRN, M. J. (Vice-President General Manager Sales, American Radiator Company) Stabilizing a national industry, what organized selling can accomplish in a period of economic depression. *Executives Service Bulletin*, July, 1930, vol. 8, p. 1-2, 4.

With the curtailment in new residential construction, the American Radiator Company turned to an extensive campaign to sell heating plants to the "old home" owners, and thus keep their sales force and all of their factories open. By extensive advertising and "teamwork" among the employees the plan has met with success.

COX, GARFIELD, V. Selected bibliography on stabilization. *Journal of Business*, July, 1930, vol. 3, p. 382-383.

STATISTICAL DEPARTMENTS—MANAGEMENT

KUVIN, LEONARD (Chief Statistician, Index Number Institute) Scientific management in a statistical department. *Management Review*, August, 1930, vol. 19, p. 251-258.

Study of statistical department can be divide^d in two parts, (1) deals with organization, which includes selecting proper personnel and obtaining adequate equipment, and (2) deals with managerial control, which includes the assignment chart, layout chart, individual time record chart and duty schedule.

STOCK OWNERSHIP

FORDHAM, JEFFERSON B. Some legal aspects of employee stock-purchase plans. *North Carolina Law Review*, February, 1930, vol. 8, p. 161-178. (Abstract in Social Science Abstracts, August, 1930, vol. 2, p. 1342.)

Material is grouped under: initiation of employee stock purchase plans; pre-emption rights, paternalistic plans; initiation of stock purchasing by labor; employee subscription contracts; provision in case of termination of employment; agreements and options to repurchase or resell and fitting the plan to industry.

National Industrial Conference Board, Inc. Employee stock purchase plans and the stock market crisis. *Service Letter on Industrial Relations, New Series*, no. 61, July 15, 1930.

Employee stock purchase plans seem to be more powerfully rooted than before stock market crash of 1929. They have secured a wider diffusion of ownership in industry and have given the worker more confidence in management, and when the purchases are confined to sound and not speculative issues, seem to justify themselves.

TESTS

MUNRO, M. S., AND RAPHAEL, WINIFRED. Selection tests for clerical occupations. *Journal of the National Institute of Industrial Psychology*, July, 1930, vol. 5, p. 127-137.

Account of results of a six months' investigation carried out on behalf of the Institute for Synthetic Ammonia and Nitrates, Ltd., including the planning of a scheme for the establishment of a central staff office to deal with selection, promotion, etc., and the standardization of psychological selection tests for ten clerical occupations. Tests and results obtained with them for 4 clerical positions are described.

TRAINING—FOREMEN

ADAIR, R. G. (Staff Supervisor of Safety and Training, American Rolling Mill Company) Foreman training that works. *Factory and Industrial Management*, August-September, 1930, vol. 80, p. 333-334, 336, 338; 531, 552, 554, 556.

Part 4: Preventing the waste of accidents and illness; Part 5: Preventing the waste of electricity, steam, air, water, coal, gas, oil and heat.

TRUSTS

JEWKES, JOHN (University of Manchester, England) Factors in industrial integration. *Quarterly Journal of Economics*, August, 1930, vol. 44, p. 621-638.

Conflict in views of American and English writers concerning industrial integration. English industry not likely to feel strong impulses toward integration, while in the United States, with the rapid growth of industry, the search for new outlets for capital investment, and the control which a few large companies now have over many raw materials, all tend to explain the present integration and the general anticipation that the movement will continue in the future.

UNEMPLOYMENT

BAKER, ELIZABETH F. (Barnard College, Columbia University) Unemployment and technical progress in commercial printing. *American Economic Review*, September, 1930, vol. 20, p. 442-466.

Investigation in representative commercial printing plants in New York City reveals less displacement of workers due to automatic press feeding and other mechanization than expected. Analysis of the 36 plants and the changes brought about from 1923-24 to 1928-29, showed that new processes and automatic feeding machines have wrought job and process elimination, but new machinery because of more business has meant employment of more men instead of less. The press assistants' "jobs" seem much less secure than the pressmen.

DOUGLAS, PAUL H. (Professor of Economics, University of Chicago and Acting Director of Swarthmore Study of Unemployment, Swarthmore College, Swarthmore, Pennsylvania). Technological unemployment. *American Federationist*, August, 1930, vol. 37, p. 923-950.

Discusses question of unemployment from two approaches: (1) are workers displaced by technological progress permanently unemployed, (2) what can be done for those unemployed during industrial adjustments made necessary by the progress of science.

Stabilizing employment. *American Labor Legislation Review*, September, 1930, vol. 20, p. 237-308.

Contents: Unemployment insurance in Great Britain, by Margaret Bondfield; Unemployment compensation, by John R. Commons; Unemployment insurance, by Franklin D. Roosevelt; Authorities discredit manufacturers attack, by I. M. Rubinow, William H. Beveridge, Olga S. Halsey, Mollie Ray Carroll, Mary B. Gilson, John R. Commons; Something is wrong by, Ernest Poole; Can management prevent unemployment, by Paul H. Douglas; What employers are doing, by Ernest G. Draper; Charity probes unemployment, by Charlotte E. Carr; What labor is doing, by Agnes Nestor; Will Congress choose the way out? by Robert F. Wagner; Permanent Federal policy; Still before the House; Timeliness requires advanced planning; Private employment agencies, by Francis Perkins; Another fee-charging swindle; Tragedy of aging worker, by B. C. Seiple; Unemployment census.

WILKE, ERNESTINE L. (Women's Educational and Research Union, Boston, Mass.) Study of unemployed men who applied for work at a Boston agency during January, 1930. *Monthly Labor Review* September, 1930, vol. 31, p. 553-559.

Records studied of 543 men showed that 50 per cent were heads of families; 38 per cent foreign born; average age 35 years; being "laid off" common reason for being out of work and about one-fourth were handicapped in some way.

UNEMPLOYMENT INSURANCE

FINE, NATHAN. Practical plans for unemployment insurance. *Labor Age*, July, 1930, p. 4-8.

Unemployment insurance does not really exist in the United States at present, according to the author, and existing plans cover but few of the industrial workers of the country. The advantages of and objections to unemployment insurance, and plans for the relief of unemployment by insurance are given.

General Electric Company. Stabilization and unemployment pension plan of the

General Electric Company. *Law and Labor*, August, 1930, vol. 12, p. 180-183.

Employment is to be stabilized by increasing force slowly when business is increasing, and resorting to overtime, so that when work begins to fall off the overtime can be cut out, the normal week can be reduced and fewer new employees need to be dropped.

The new plan of relief has following principles: Equal contributions from employees and company, joint participation in administration of plan, aid through group action to those who are in need or require temporary loans, in times of unemployment emergency, coöperation and assistance from those employees not usually affected by unemployment and assistance from company in equal amount.

McKENZIE, G. GRANT (Acting Secretary, British Labor Party Research Department) State provision for the unemployed in Great Britain. *American Federationist*, August, 1930, vol. 37, p. 957-965.

Total number of unemployed registered April 28, 1930, was 1,698,386. Apart from small amounts of private charity, the maintenance of unemployed has fallen on the unemployment insurance scheme and on the Poor Law. The former is administered by the Ministry of Labour through a national system of local exchanges. Contributions, benefits, conditions, and disqualifications for receipt of benefits, and claims procedure are discussed. The methods of payment of the Poor Law fund, which is paid out of local taxes, is also described.

UNEMPLOYMENT RELIEF

An unemployment remedy. *Engineer* (London) June 13, 1930, 2 p. (Abstract in *Factory and Industrial Management*, September, 1930, vol. 80, p. 561.)

Movement on Continent in favor of bringing down selling prices by reduction of wages, in hope that larger consumption of goods will provide work for unemployed; experiment is to be tried in Germany.

UNEMPLOYMENT—SURVEYS

HOGG, MARGARET H. (Russell Sage Foundation) Sources of incomparability and error in employment-unemployment surveys. *Journal of American Statistical Association*, September, 1930, vol. 25, p. 284-294.

Article suggests that not all the points which it covers must be investigated and distinguished in all surveys, but that the essentials are: adequate employment, classification of the enumerated person; idleness rates based on the proper totals and rigorous sampling, preferably by households rather than blocks.

Unemployment in Bloomington, Indiana, February, 1930. *Monthly Labor Review*, July, 1930, vol. 31, p. 37-39.

Every home in city visited and for the 612 persons unemployed, statistics were obtained as to period out of work, age distribution, dependents, causes of unemployment and occupations.

Unemployment in Philadelphia, April, 1930. *Monthly Labor Review*, July, 1930, vol. 31, p. 35-37.

Survey shows that unemployment was more severe in April than any time since 1921-22. House to house canvass was made of 36,100 families by Bureau of Compulsory Education and the Industrial Research Department of the University of Pennsylvania.

Detailed analysis of the results of this survey to be published within next few months.

VACATIONS

Holiday observance in collective agreements. *Monthly Labor Review*, August, 1930, vol. 31, p. 269-280.

Includes bakery workers, barbers, brewery workers, clothing workers, retail clerks, steam and operating engineers, meat cutters and butcher workmen, teamsters and chauffeurs, bookkeepers, stenographers and typists, window cleaners, hotel and restaurant employees, laundry workers, masters, mates, and pilots, upholsterers, commercial telegraphers, pocket-book workers, printing-trades

workers, railroad employees, street-railway employees, workers in other trades.

WAGES

"Annual" wage for Labor. *Information Service*, September 20, 1930, vol. 9, p. 3-4. A guaranteed annual wage which is equivalent to a minimum yearly salary, would solve the problem of unemployment, according to statements made by labor leaders.

Dangers in wage cutting. *Information Service*, September 20, 1930, vol. 9, p. 1.

Suggests managers of industries maintain wages and standards, and work for reduction of living costs rather than wages.

FILENE, EDWARD A. (President, William Filene's Sons and Company) \$25 a week for retail salespeople. *Nation's Business*, September, 1930, vol. 18, p. 27-29.

Higher wages is one of the profitable necessities of efficiently managed business. The attraction of highest grade salespeople is one advantage of a high minimum wage, and public knowledge that

store has "select" personnel would be best kind of advertising.

United States—Labor Statistics Bureau. Union scales of wages and hours of labor, 1913 to 1930: preliminary report. *Monthly Labor Review*. September, 1930, vol. 31, p. 690-713.

Bureau of Labor Statistics has collected information in principal time-work trades in 67 leading cities of the United States. An abridged compilation is given in this article which includes 20 trades in 40 localities.

WAGES—PAYMENT METHODS

WOODBIDGE, C. K. (President, American Machine and Metals, Inc.) How should we pay our salesmen? *Printer's Ink*, August 7, 14, 21, 28, 1930, Vol. 142, p. 3-4, 6, 138-139; 81-82, 84, 89, 50, 52, 57-59; 103-104, 109.

"What to consider before setting up a sales compensation plan; Outline of salesmen's compensation plans; Qualitative analysis of salesmen's compensation plans; Salesmen's compensation and the future."

News Notes

ACTIVITIES OF MEMBER ORGANIZATIONS

Vocational Service for Juniors

The 1930 edition of *Opportunities for Vocational Training in New York City* has been published by The Vocational Service for Juniors.

Under a wide variety of occupational headings it describes schools and courses where training may be had. Essential information concerning the courses is given.

The directory includes only those schools which give some form of trade, commercial, professional, or semi-professional training, or in other words, those schools whose training is intended as a preparation for a definite type of work. All schools included have been investigated and are known to offer thorough and reliable courses.

This useful booklet may be obtained from The Vocational Service for Juniors, 122 East 25th Street, New York City, for fifty cents.

Young Men's Christian Association

Research and Studies II is a report of studies that have been going forward in the Young Men's Christian Association. It is arranged in three sections. The first, edited by Hedley S. Dimock, deals with measures of character. In addition to the abstracts of studies within the Association, it summarizes other research bearing upon the present status of character measurement.

The second section, edited by James W. McCandless, offers a picture of survey procedure as it is developing in the life of the Association at present. The third section, edited by Delia H. Biddle and Goodwin Watson, covers a miscellany of remaining projects.

This volume can be procured from the Association Press, 347 Madison Avenue, New York City, at two dollars a volume.

Boston Elevated Railway

The Boston Elevated Railway has launched its ninth annual educational program. Seventeen courses are offered, dealing both with direct transportation problems and with broader cultural matters.

BRITISH PROFESSORSHIPS IN INDUSTRIAL RELATIONS

Professorial chairs in Industrial Relations have been established in the Universities of Leeds, London, Cambridge and Cardiff, Great Britain. The courses of study will include such matters as personnel administration, works councils, welfare, safety, collective relations, including trade unionism and employer associations, collective bargaining and labor legislation. It is planned to treat the subject from an international as well as a national point of view.

COTTON-TEXTILE INSTITUTE

Discontinuance of night work for women and minors was unanimously recommended to the cotton mills of the United States by the Board of Directors of the Cotton-Textile Institute at a special meeting held in New York City. Walter D. Hines, Chairman of the Board, presided.

Leading cotton mill executives, representing a large part of the industry, came to New York for this meeting and without a dissenting vote the 45 members of the Institute's Board in attendance recommended that the employment of women and minors under 18 years of age be discontinued between the hours of 9 p.m. and 6 a.m. as soon as possible and not later than March 1, 1931. There was a very strong sentiment manifested in favor of making the period of discontinuance even longer than from 9 p.m. to 6 a.m.

The recommendation will carry with it

at the outset the support of one-third of the total spindleage of the country, including most of the largest cotton textile mills.

STABILIZING EMPLOYMENT

The September, 1930, number of the American Labor Legislation Review is devoted to consideration of unemployment and stabilization of employment. It contains a wide variety of articles by a large number of experts, including Robert P. Wagner, Paul H. Douglas, Frances Perkins, Franklin D. Roosevelt, and John R. Commons.

PRINTING EDUCATION

The Educational Department of the New York Employing Printers' Association has in session a wide variety of educational courses for printers. The offerings include: Advertising for Printers, Applied Design and Layout, Binding, Cost Accounting for Printers, Elements of Printing and Printing Processes, Estimating for Printers, Practical Public Speaking and Personality Development, Proofreading, and Selling for Printers. The Association is sponsoring other courses at both Columbia University and New York University.

WHAT WAGE EARNERS PAY FOR SICKNESS

According to a survey made by the U. S. Bureau of Labor Statistics a few years ago, two per cent of the American population is sick at any given time. The cost of this sickness aggregates the total of more than two billion dollars every year.

Since this survey, another made by a life insurance company shows that approximately \$80 per year is spent by each wage-earner's family as the cost of sickness. This amount would not seem to be excessive—if it could be safely assumed that eighty dollars would cover the cost of all sickness from which the family might suffer. Unfortunately, no family can arbitrarily fix any given sum to be spent. Ill health and its attendant medical attention may not be the only items to make inroads upon the family's "sick budget." A large dental job may present itself; a major operation may suddenly be required, or a contagious disease

may infect some or all of the family—then where does the eighty dollar budget come in?

An average of \$80 for a sick budget represents a combination of larger and smaller amounts that vary from next to nothing to thousands of dollars per year. So long as sickness expenditures do not exceed the eighty dollars, so long can the budget hold its own. When it exceeds that amount trouble begins—for that family. They are either forced to go into debt, or accept charity. The latter is something nobody cares to do, so it often happens that the family resorts to quackery, patent medicines or does without medical attention entirely.

Tuberculosis, alone, is responsible for a death rate that is from eight to twelve times higher among certain industrial workers than it is among farmers, for example. As menacing as these figures sound—and, in reality, are—the tuberculosis death rate has been declining since those statistics were compiled a few years ago. It is still altogether too high, (79 out of every 100,000 persons) and tuberculosis still kills more persons between 18 and 40 than any other disease. At the same time, the rate has been cut in half in the last 20 years.

It is not too much to say that the educational health programs that are made available by tuberculosis associations have had considerable to do with this decline. Neither is it too much to add that the little Christmas seal that appears every holiday season has played its part in proving that tuberculosis is preventable. The money derived from its sale makes it possible to present effective health programs; to establish clinics and especially to help maintain summer camps for children who will become the industrial workers of tomorrow.

SELECTING ENGINEERING STUDENTS

Carl C. Brigham, of Princeton University, in reporting on a ten year investigation for the Cooper Union Institute of Technology, New York, revealed that high school records are the surest indication of future success in engineering college. While high school achievement is the best single criterion, it must be weighed against results of intelligence and placement tests.

The number of applicants to Cooper

Union has grown to such proportions in recent years that the utmost care must be exercised in selecting candidates to be admitted.

PERSONAL ITEMS

President JAMES R. ANGELL, of Yale University, who as Chairman of the National Research Council ten years ago was active in the organization of the Personnel Research Federation, underwent a serious operation during the summer, but has made a satisfactory convalescence and has resumed in full his regular duties.

EUGENE J. BENGE has become Manager of Personnel of The American Oil Company, Baltimore, Maryland. His duties embrace selection, training and follow-up of clerical and sales personnel, as well as responsibility for effecting economies in these groups.

FLORENCE JACKSON, consultant to the Personnel Bureau of Wellesley College, is spending several months at various colleges and universities, lecturing on women's occupations, and holding round table discussions and conferences with administrative officers, faculty members, and individual students. The month of October was spent largely in New York state; November and December will be in Ohio and Indiana; January in Maine, and the first part of February in Pennsylvania. Following the Detroit meetings of the National Vocational

Guidance Association and the Personnel Research Federation, February 19-21, her itinerary will take her to various institutions in Michigan and Virginia.

JOHNSON O'CONNOR spent a large part of the summer in the west testing members of the sales departments of the General Electric Company. He has also been engaged by the Teletype Company to supervise employment testing at the Chicago plant.

C. P. YAGLOU has been appointed Assistant Professor of Illumination and Ventilation at Harvard University. He has contributed to the Personnel Journal on the subject of modern ventilation principles.

JOHN R. SHILLADY, recently Administrative Secretary of the First International Congress on Mental Hygiene, and at earlier periods Secretary of the New York State Industrial Board, Director of the (New York) Mayor's Committee on Unemployment (1914-1916) and Executive Director of the National Consumers' League, has joined the executive staff of the Personnel Research Federation.

Mr. Shillady will devote himself primarily to the organization problems of the Federation—the extension of its service to a wider field than has hitherto been possible. Special effort will be made to increase the membership affiliations and to secure a broader basis of financial support.

Ninth Annual Fall Conference of the Personnel Research Federation

SELDOM has a conference of the Personnel Research Federation covered a wider range of subjects than its Ninth Annual Fall Conference held November 13 to 15. Time was devoted to conferences on Personnel Administration in Hotels, Personnel Administration and Research in Industries and Stores, and Measurement of Attitudes, Interests and Morale, as well as to the Annual Dinner.

This issue of the *PERSONNEL JOURNAL* is given over to publication of a number of the papers and addresses presented.

CONFERENCE ON PERSONNEL ADMINISTRATION IN HOTELS

The growing interest of hotel executives in carefully formulated personnel procedures was shown at the session on Personnel Administration in Hotels. Richard S. Uhrbrock, formerly of the Cornell University School of Hotel Administration, opened the session with an address on "Introduction of Personnel Administration into a Hotel." After pointing out that recent strides in the hotel industry make it necessary for management to give more attention than ever before to its work with men as well as with money and materials, Dr. Uhrbrock outlined the successive steps in introducing modern personnel methods into a hotel which aims to

stabilize employment, save the costs of labor turnover, train its supervisors and employees for efficient service, cut down accidents, and maintain high standards of health, loyalty and morale.

Walter L. Gregory then described methods used at the Palmer House, Chicago, of which he is manager. Here there is decentralization, responsibility for employment, training, supervision and discharge being placed with the various department heads. Further discussion brought out common ground for reconciling in part the clearly opposed views of these two speakers.

John C. Burg, of the Hotel Pennsylvania, New York, who spoke next on "Training for Service," pointed to the important part in creating guest goodwill played by employees trained to give perfect service, and traced the ideal of service as it has evolved in the Statler organization. As a basis for such training all complaints are solicited and analyzed to ascertain the causes. This yields specific material for instructing employees in the best ways of satisfying guests. But more than that, a survey of every department and an analysis of every job in the department is made as a basis for training and for efficient management.

Using as his watchword "Satisfied employees make for satisfied guests," R. O. Pickard, Personnel Director of

the New Yorker Hotel, proceeded to show how "centralized employment" and centralization of other personnel functions makes for satisfied and efficient employees. The first step is selection of the right person for the right job. Suitable records are kept to insure fair promotion, thus supplying incentive to conscientious work. High labor turnover, the ever present cause of dissatisfied guests and the thief of profits, is cut by a properly functioning centralized employment department.

Edward J. Feeney, Personnel Manager of the Hotel Astor, New York, took up the cudgel in favor of a department for centralized employment and for other matter pertaining to the relations of the worker to his job and to management. Pointing out that all large industrial organizations long ago recognized this need, he added that the hotel industry is not fundamentally different and peculiar—both employ human beings—and with convincing arguments urged the management of every large hotel to adopt this plan of centralizing labor control through a Personnel Department.

As one of the first repercussions of this pioneer meeting, a few New York City hotel executives have already sat down together and decided to exchange experience frankly with regard to labor turnover in the several departments, causes of leaving, and other employee problems in their hotels.

CONFERENCE ON PERSONNEL ADMINISTRATION AND RESEARCH IN INDUSTRIES AND STORES

The executive training program and the Institute of Technology of the Gen-

eral Motors Corporation was described by N. F. Dougherty. He told how the equivalent of a full college course is given at the Institute, which is conducted on a cooperative basis. The intent is not to make mechanics, nor to graduate general managers, but to develop men who will better fill the supervisory and technical expert positions of the Corporation. The executive training program, consisting of Outlines of Industrial Development, Department Management, Economics of Industry, and Factory Organization, was described in detail.

Three staff members of the Research Bureau for Retail Training described various phases of the work of that organization. David R. Craig, the director, summarized its outstanding contributions to personnel management resulting from investigations made during ten years of cooperative research with department stores and industries. Recently the Bureau has widened its field of study to include many functions that were originally considered to be outside the personnel field.

Reporting a study of executive induction practices in twenty-seven department stores, Natalie Kneeland discussed the procedures used in employing the new executive, practices followed in familiarizing him with the store and the job, incentives offered to stimulate him, and problems met in orienting him with reference to his new responsibilities.

The third speaker on the department store program, Gordon Grant, reported the methods and the practical conclusions of an investigation which undertook to ascertain the optimal

size of the delivery truck fleet for one large store.

ANNUAL DINNER

A large gathering heard the brilliant addresses of Whiting Williams, Henry Bruère, and Albert Edward Wiggam at the Annual Dinner. Using as his topic, "The Worker's Mind Today," Mr. Williams related observations made while spending the past summer unshaved and shabby hobnobbing with workers and workless. Particularly impressed by the amazing ingenuity of the unemployed in somehow getting along, he commented on the various conditions and circumstances which are enabling the workers to meet this depression better than the last. He noted particularly: a sense of proprietorship in the job, for the worker may expect to be sent for when operations resume, and need not hang outside the gate; more savings in the bank, perhaps in part because he has spent less for drink; and a broader basis of family support, for members of the family other than father may be employed. In conclusion he analyzed the deep lying causes of the dislocation of business, stressing in addition to those most often mentioned, the shortsightedness of budget-minded bankers and directors who will appropriate large sums for improvement of process but not for research in the invention and development of new products. Henry Bruère, while hesitating to be too optimistic concerning the present unemployment crisis, did show that high-calibre executives are assuming a more statesmanlike leadership than they have in the past.

Departing from the theme followed

by the first two speakers, Mr. Wiggam described the contributions of industrial psychologists toward happy adjustment of workers to their work.

CONFERENCE ON MEASUREMENT OF ATTITUDES, INTERESTS AND MORALE

To return to the regular formal sessions, Sadie Myers Shellow presented a paper on "The Strong Interest Blank as an Aid to Interviewing," in which she demonstrated that this blank, in addition to being a good means of establishing rapport, reveals hints of personality traits and motivating forces which may be probed further in the course of the interview. She also showed how responses on the blank differentiate executives from non-executives.

The increasing number of investigators and executives who are coming to view the measurement of attitudes as one of the most important provinces of industrial psychological research were especially gratified to hear J. David Houser and two other members of his organization describe their studies in this field. In outlining "The Field for Attitude Measurement," Mr. Houser delineated two broad divisions: (1) Attitudes toward the service of an organization as held by people outside the organization but served by it—clients, customers, representatives, and so forth; and (2) attitudes of people inside the organization toward the organization and their working relationships. Then he laid the theoretical basis for objective measurement of morale and attitudes.

Raymond Franzen touched upon statistical methods used to evaluate

specific beliefs and attitudes, and pointed out some of the many pitfalls encountered in attempting their measurement.

The administration of an employee attitude test, or test of morale, was described by H. R. Halsey. While little of the actual content of the test was divulged, he showed how it was

administered to groups of employees in such a way as to insure frank responses.

These reports brought to a close this highly significant conference which in its breadth of interests reflects the growth of the movement which the Personnel Research Federation represents.

The Research Bureau for Retail Training

Its Work and Its Problems*

BY DAVID R. CRAIG, *The Research Bureau for Retail Training*

Dr. Craig, now Director of the Research Bureau for Retail Training, surveys its accomplishments and problems from the point of view of one who has been connected with its work almost from the beginning twelve years ago.

THE Research Bureau for Retail Training was started in 1918 as a cooperative experiment between certain of the Pittsburgh merchants and the Carnegie Institute of Technology. The purpose of the experiment was to see whether an educational institution, with the help of applied psychology, could do anything for department stores. The experiment was to run five years.

That was more than twelve years ago. Since then the Bureau has reached beyond its original boundaries. It has transferred its allegiance to the University of Pittsburgh. It has gone outside of Pittsburgh. On a few occasions it has worked in manufacturing industries and public utilities as well as in department stores. And now, quite recently, it has decided to expand and enrich its definition of personnel and training, to widen its field of study, and to include many functions that were originally considered to be outside the personnel field.

In this paper we shall present first the changes in the organization of the Bureau, and second the development of its policies. By that time we shall be ready to discuss its present problems and its hopes for the future.

I

As one of the pioneers in personnel research in department stores, the Bureau was confronted at first with the definition of problems. Dr. J. B. Miner, and later Dr. W. W. Charters, with the help of Dr. W. V. Bingham, undertook that task. The department stores of Pittsburgh provided a willing laboratory, and their owners and managers were frequently consulted. As the problems were slowly defined, the work began to grow. The first graduates of the Bureau course were the first research workers in the field. As their product, the material publications of their research were put to use in the stores, evaluated, corrected, and tried again.

*Presented at the Ninth Annual Fall Conference of the Personnel Research Federation.

the whole experiment came up for appraisal, it was renewed. At the same time two other events changed the Bureau organization.

It was about this time that the Bureau was transferred across the bridge to the University of Pittsburgh. And the Pittsburgh stores, in order to make the Bureau a permanent institution, endowed it for about a half a million dollars.

Within the next two or three years, word of the Pittsburgh project spread to merchants in other cities, and an increasing number of inquiries reached the Bureau. Finally, one eastern store made a definite request that it be allowed to participate in the experiment. That request crystallized into a plan by which the extension service of the Bureau was offered to certain department stores within easy reach of Pittsburgh, and under the direction of Dr. James H. Greene the extension membership of the Bureau was inaugurated.

The conditions of the extension memberships are interesting. The administrative committee decided that the service and research of the Bureau should be offered only to stores which could be reached by an overnight ride, and to stores with a training staff adequate to make effective use of the material. The Bureau offered the accumulation of its findings; visits by staff members to help in establishing training programs which would incorporate the various manuals and to survey specific store needs; an information service from which quick and inclusive answers could be obtained to many questions of personnel administration and training; and an an-

nual conference of personnel workers in the member stores. In return the Bureau asked its member stores to make use of its material; to send its personnel workers to the annual conference; to plan the work as a three-year program; and to pay a modest fee.

Some twenty stores outside of Pittsburgh came into the Bureau circle. They were representative of all types of department stores, and their presence in the group contributed greatly to the richness of the Bureau research. At one time we estimated that in combination with the Pittsburgh stores, the total annual business of the Bureau membership amounted to about four hundred million dollars, and that the staff, through the personnel and training departments of its members, was helping to increase the skill and the happiness of about forty thousand employees. Since that time some stores have dropped out of the membership, and others have been added.

With the increase in its budget which the extension fees permitted, after deducting additional expense for travel in visiting the stores, and for printing and mimeographing the additional material required, the Bureau had enough left over to use in increasing the research staff. The increased staff in turn was able to complete a larger number of research projects, and to give more careful supervision to the work of students. At the present time the senior staff contains one research worker and teacher for every two graduate students, a situation which is possible only because the Bureau has resolutely insisted on appropriating more of its time to research than to teaching.

With one exception this is the story of the organization of the Bureau. That exception concerns the presence in the Bureau of manufacturing industries and public utilities. From time to time the Bureau has been approached by manufacturers who have a problem of selling or a problem of public relations and who visualize their problem to be the same as that of the department stores—namely, to establish training programs which will help the salesmen to sell the product in an effective way, that is to say, to sell it as an article which really meets its customer's need; and to help in the selection and training not only of salesmen, but also of the executives who are to supervise the salesmen. This type of work has been done for the American Radiator Company, the Cooper Underwear Company, the Philadelphia Company, the Studebaker Corporation of America, and the West Penn Power Company.

At the moment, the Bureau consists of nine Pittsburgh members, seventeen extension members, eight members of the research and teaching staff, an able and willing office group, and fifteen graduate students who are really research assistants,—all as a part of one university.

II

We can now go back over the same ground which we have covered, looking this time at the development of research methods and findings rather than at the organization. We shall see one undercurrent of continuity in that development, namely, the ability of the staff to adapt its program closely to the current problems and interests

of the stores. Indeed, it is one of the Bureau's accomplishments that it has once or twice been the interpreter and announcer of those needs before they have been wholly apparent to the stores.

You will remember that the Bureau began in 1918. You will also remember that 1918 was a year of relative prosperity, that the armies had not yet been returned to their peace-time occupations, and that the primary concern of business was the selection of its employees. It was quite natural, then, that during the first two years, problems of selection and placement should have occupied the stage of the Bureau microscopes.

During this period the grading of abilities through rating scales and tests went hand in hand with the analysis of department store jobs. We discovered early in our history that the first step in selection is a thorough understanding of the job in question. As the Bureau grew in intimate knowledge of store problems and methods, the job analysis came increasingly into use, as a way of making precise what had hitherto been well known to store executives, but only as an unwritten understanding. The tests were continued for several years, and subsequently interest questionnaires were added. But in the department store employment situation, particularly for salespeople, the staff never felt that the results obtained from the test research were valuable enough to warrant recommending their use.

In later years two other department store interests were defined and studied. One was the employment department operation, and studies were made of

personnel budgets, the technique of employment interviewing and of employment follow-up procedures. The other was the study of personality traits and rating scales. Intended originally for the purpose of grading individual effectiveness for employment department purposes, it soon became clear that they were useful in training, especially as training became decentralized and as individual conferences with employees replaced classroom work.

As the job analysis was continued and refined, the first training activities were developed. It was clear that some parts of the work were more difficult than the others, and it appeared to Dr. Charters, then the director, that this was the opening for a quite practical training program. By means of what he called the difficulty analysis and the method of unrecorded specifics, the staff and its students analyzed the activities of the poorer salespeople in order to find at what points they fail. With this list of the difficulties a large number of personal interviews with the more successful salespeople were held, and from them the interviewers elicited the methods and devices which they use in overcoming the difficulties of their weaker colleagues. Thus, in the material called *The Technique of Selling*, the Bureau was able to collect tested methods of overcoming some very real weaknesses. A study of leadership methods was made in the same way.

It was also clear that not all of the success of successful salespeople depended on their ability to sell. Some of it was due to their knowledge and use of merchandise information.

Those who were early in the work of department store training will remember the type of merchandise information then available for teaching: it taught how things were made, how many threads to the inch, what kind of loom had been used, and how the fur had been stripped from an unborn Persian lamb. But most of this information was useless in answering customers' questions about durability, suitability for occasions, style, fastness of color, and so on. From the point of view of the customer, the salespersons' information was beside the point. To provide a new kind of merchandise information for the training directors in Pittsburgh stores, Miss Kneeland and Miss Ringo prepared eighteen manuals in which various classifications of merchandise were discussed according to the customers' interest. Customer's questions were collected and analyzed, and salespeople were interviewed to find out what customers want to know, and the resulting point of view was used as the control factor in selecting the contents of these manuals.

In one of the member stores, merchandise information has recently been summarized under the caption "What to Say" and salesmanship, or the technique of selling, as "How to Say It." For many departments in the store the Bureau had now completed these two aspects of the selling situation. Its next task was to make sure its work was being used.

This task divided naturally in two parts. The first part was to investigate the current uses to which the Bureau manuals and personal service were being put. As a result of that

investigation the Bureau felt that not enough attention was being paid to training on the job. No matter how well the teachers in the classroom taught their classes, nobody mistook them for merchants, nobody felt that what the teacher said in the classroom was as important as what the department manager said downstairs, and often the employees' absence in the classroom irritated the department manager because he felt that he needed them on the floor to wait on customers. Here and there a buyer or an assistant buyer was found who was not only an able merchant but a good developer of men and women, a good trainer; yet most of them were good merchants only, with no ability or appetite for training their assistants. After some study the Bureau helped to correct this situation by issuing manuals about department training for salespeople, department meetings for salespeople, various trainer's guides, training executives to train, interesting executives in organized department training, and finally the organization and administration of training. All these studies were directed at the problem of organizing the training in such a way that it could be accomplished by the same people who buy the merchandise and manage the various departments of the store. This plan, obviously, avoids the stigmata of formal schooling in a business organization, and gains for training the great wealth of personal experience and merchandise information in which the department managers easily excel most training department representatives.

In the work of organizing departmental training in stores, it was found

wise by many stores to divide the training staff among the major divisions of the stores, such as the apparel division, the home furnishings division, the accessories division, and so on. Thus the training department representative came into being, and by working in a limited territory has acquired a knowledge of the merchandise and the people, and has been able to be of real assistance not only in helping buyers and department managers to prepare for their meetings, but also in holding individual interviews with salespeople.

As a corollary and a further development of training by departmental executives, studies were conducted at first for training executives to train, and later for training executives to be better executives. The past few years have seen an exceedingly heavy turnover among major and minor executives in the stores, and the methods of choosing the successors of those who leave, of orienting them in their new positions, and of training them to become quick producers, were reported in various Bureau studies, among them the manual on discovering and developing junior executives, the series of orientation folders for new executives, and the study of the induction of the new executive which is to be reported this afternoon by Miss Kneeland.¹

While these studies of training organization were in work, the second approach to the use of Bureau material was being developed. This was the service shopping survey. Each year for the last nine years the Bureau has employed a group of women who

¹ See page 371.

are typical customers. They are asked to go shopping and to record their impressions of the service received, answering specific questions. If the training programs that are in use in the stores are really effective, it is reasonable to suppose that over a period of time the service will improve. That is the case in Pittsburgh. At the beginning the summaries of the service shoppings showed that one customer in every two had received satisfactory service. In the past few years the figure has exceeded three out of four, or an improvement of about fifty per cent. The analysis by stores for various items in the service shopping forms shows the training directors the direction which current training may profitably take, and the individual reports are returned to the stores to be used in interviews with salespeople. Service shopping is now in wide use as a check on training progress.

Thus by helping stores to organize for the use of its material, and by establishing a check on its effectiveness, the Bureau has tried to emphasize the practical quality of its work.

Two more developments should be described briefly. The first is the work in art and fashion which began four years ago at the time when Dr. Greene saw style becoming important to department stores as a controllable factor in merchandising. The objective of this work was to give to salespeople generally the fundamental principles of art and the current trends of fashion, in the hope that not only in clothing and accessories but also in home furnishings, salespeople might make increasingly satisfactory recommendations to customers.

The second was the group of production studies, begun about the time that the Bureau was transferred to the University of Pittsburgh. In a few of the so-called non-selling departments of the store, such as the bureau of adjustment and the receiving and marking departments, attempts to train employees in improved methods were manifestly beside the point until the better methods had been developed. As a result, procedures were analyzed and compared for these and other departments, and after a satisfactory working outline had been arranged in each case, a training program was prepared. In many cases it was necessary to make a separate program for the system which best fitted each store. One of the studies in this group is the analysis of methods and requirements in delivery departments, made by Mr. Grant.

This is the major story of the Bureau's development up to nineteen thirty. While it is impossible to describe each study in the time allowed, the most significant tendencies have been indicated. In all its work, the Bureau has stressed the use which was to be made of the result. This was not research work only for the sake of solving problems. It was intended that the solution of the problems should be useful to some particular person in a store, and was prepared with that end in view. With only a little adaptation to meet special requirements, most of the Bureau's output can be worked into the stores' routine in the form of a new program, a new procedure, or a new method. This is probably the distinguishing characteristic of the Bureau's method.

III

We come now to the problem which confronted the Bureau about a year ago. We had reached the point at which returns within the stricter definition of personnel research had begun to diminish. Of course there were plenty of personnel problems yet unsolved; but there were not as many as there had been, and the staff of the Bureau felt that a more important and perhaps a more dramatic gain could be made by stretching its coverage to related fields. Training in stores was now being done by line executives with the help of the training departments, rather than by the training departments themselves. A larger proportion of the Bureau's graduates were entering the field of merchandising, using their experience in training and research to improve their executive work. This is as it should be, for a personnel experience and attitude, and a research background, are nowhere more valuable than in the line. More and more demands were being received from stores for information about specific departments, about merchandising and display and publicity, even about control. If the Bureau was to continue in the production of useful research material, it must once more adapt itself to the changed situation and the changed demand in its stores.

With these considerations in view, the requests for research during the past year were reclassified and a new program was arranged. The staff this year, together with the students, is engaged in the preparation of manuals for three specific selling departments. The person for whom each one is being prepared is the manager of the de-

partment. Each manual will contain sections on department management, publicity, control, merchandising and merchandise information, and activities of salespeople. The three departments were chosen for their interest to store owners, and for their profit-making and trouble-making possibilities.

In addition, a study of morale has been undertaken, partly to tie the Bureau more obviously to its own past, but more directly to answer the immediate needs of member stores. It comes at an opportune moment, when the widespread reduction of the working forces has affected not only those who remain hopefully at work but also their supervisors.

These studies have been divided among the members of the research staff as follows: Miss Natalie Kneeland, who is executive secretary of the Bureau, is supervising the morale study. In the three departmental studies, Miss Louise Bernard will superintend the section on the activities of salespeople; Mr. Bishop Brown has charge of the section on department management; Miss Grace D. Ely and Miss Hazel Karnahan of the sections about merchandising and merchandise information, Miss Ely for the apparel departments and Miss Karnahan for the home furnishings departments; Mr. Gordon A. Grant and Miss Geraldine J. Kelly will supervise the publicity section; Mr. Grant and Mr. Brown have charge of the control section. These assignments have been made and accepted in accordance with the plan of organizing the staff work to conform more closely with the organization of department stores.

From the three departmental studies the Bureau expects certain valuable results. To the stores which participate, it will issue fresh material about the operation of three important departments, written down as the product of research but in the old familiar form of new programs, new procedures, and new methods. For the students, the experience of finding the answers to questions about department management, control, publicity, merchandising, and the activities of salespeople should help to give them an experimental attitude toward their later work in stores and should fit them for early promotion to minor executive positions in the line. Supplemented with the regular Bureau classwork in store organization and management, personnel administration, psychology, training methods, and art and fashion, they should be well equipped for positions as training representatives, and thus their value to stores next June should have increased. The staff expects to profit by learning techniques for the analysis of merchandise departments and will be able, after a while, to put into the curriculum a few home-grown units of merchandising and other fields for which the class has hitherto been sent to the books of others.

Although this newest development

in the Bureau program is not obviously to be classified under the heading of personnel, nevertheless, when it is carried on by a group of personnel research workers whose special interest in the human element of the department store extends back over thirteen years, it cannot fail to contain a strong personnel flavor. If it were necessary to justify this development, even at a meeting of the Personnel Research Federation, that sanction might be discussed in terms of the higher personnel research. As I said before, we discovered early in our history that the first step in personnel research is a thorough understanding of the job in question. Now we have discovered it again. What we are doing is a larger job analysis. Rightly understood, we have begun once more to analyze the job of the retailer. As we make progress in that analysis we shall be defining the units of the art of retailing, and as fast as we can make those units so definite that they can be numbered and measured and counted and compared, we shall have helped the retail distributor to make the transition which others have made and that he will eventually make. We shall have helped him to cross the bridge from art to science.

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Induction of the New Executive*

BY NATALIE KNEELAND, *Research Bureau for Retail Training*

While Miss Kneeland's study of practices and problems in selecting the new executive and introducing him to his work is based upon the experience of department stores, the findings have practical application in any industry or business.

Executive induction practices of twenty-seven department stores are described and discussed. The situation is viewed from four aspects: 1. procedure for employing the new executive; 2. practices followed in familiarizing the new executive with the store and the job; 3. incentives offered to stimulate the new executive; 4. problems met in orienting the new executive.

HAVE you ever had stage-fright? Were you ever thrust into a job for which you felt woefully unprepared? Have you ever been in the embarrassing situation of having to explain the why and wherefore of your presence to a group of rather resentful employees of whom you had just been put in charge? If not, you are fortunate, for people all around us are experiencing just such painful feelings every day, which is one of the reasons why the subject of the induction of the new executive now takes its place on the program.

No matter what our own individual experiences may have been along this line, I believe that we would all agree

that the way in which a new executive is put into his job determines largely the speed at which he becomes productive. This is true no matter what the nature of the work in which he is employed. It holds true for buyers, foremen, department heads in industrial plants and school teachers. We like to think that we do a very successful job on this induction process. We often pride ourselves on the fact that our policy is to promote from within. Too often, however, this is more theory than fact. It is my purpose, therefore, to review some of the points we need to consider before we attempt to answer the question, "Are we doing a good job of induction?"

In order to make my illustrations quite concrete, I shall follow closely the procedure carried out in a recent investigation in the department store field. This study, *The Induction of the New Executive*, was sponsored by the Personnel Group of the National Re-

*Presented at the Ninth Annual Fall Conference of the Personnel Research Federation. Material for this paper was drawn from the study, "The Induction of the New Executive," sponsored and published by the Personnel Group of the National Retail Dry Goods Association, New York.

tail Dry Goods Association and carried out by a committee composed of six members of this group. As chairman of this committee I was able to follow the progress of the study in detail. The purpose of the study was to arouse interest in the subject of executive induction and at the same time to discover practices already in use. It was in no way a statistical investigation of the subject. The information obtained represents the contributions of twenty-seven stores who responded to a questionnaire sent out by the committee. I shall not attempt to give the entire results of this study in detail, but, as indicated a few moments ago, shall follow the general plan of procedure in my discussion.

Before embarking on the subject of the induction of the new executive, we must define our terms in order that we may be talking the same language. For the purpose of discussion, let us define induction as the installation of an individual on his job and subsequent follow-up in order that he may find himself as quickly as possible. A new executive may be any individual that our organization ranks as an executive who has either been recently appointed to or is being considered for appointment to an executive position, whether appointment comes through promotion from within or by employment from without.

As we begin to think about this whole problem of induction, our thoughts tend to revolve around four different aspects of the situation: first, procedure for employing the new executive; practices followed in familiarizing the new executive with the store and the job; incentives offered to stimulate the

new executive; and finally, problems met in orienting the new executive.

PROCEDURE FOLLOWED IN EMPLOYING THE NEW EXECUTIVE

First, let us consider the problem of employment. Probably the question that arises immediately in everyone's mind is whether the organization promotes from within, or whether it draws most of its executives from without. This is natural since it has such a direct bearing on the induction procedure and on the morale of the employees. It is to be noted that I purposely phrased the question in the form of practice rather than of policy. To check up on this point in our department store survey, we asked the question, "In the last six months, how many executive and junior executive positions have been filled by promotion from within and by hiring from without?" Of the twenty-two stores replying, the range of percentages of positions filled by promotion from within was from 23 per cent to 98 per cent with a median of 70 per cent; from without, from 2 per cent to 77 per cent with a median of 30 per cent. Too much importance must not be laid on these actual figures since they are based on only a few cases. Moreover, the actual number of vacancies filled in each case must be considered in evaluating the importance of the percentage figure. For example, in the store having 77 per cent of the vacancies filled from without, the actual number of vacancies filled was 35, in contrast to 120 vacancies filled in a store reporting 92 per cent of vacancies filled from within. While these figures are not of great value statistically for purposes of comparison between stores,

they are of significance to a given store where they indicate marked discrepancy between theory and practice.

The next question that arises is, "When a vacancy occurs among executives or junior executives, what is the first step in filling the vacancy and who is responsible for this step?" Again, department store practice may offer some suggestions. To quote directly from questionnaire data, we found that "first of all, there is the formal notice that the vacancy will occur or has occurred. This may take the form of a requisition, written or verbal, submitted by the head of the division in which the vacancy is occurring. Use of bulletin boards for posting notices of vacancies is made by several stores. In some stores every executive vacancy is posted, and anyone may make application for it; in others, vacancies are posted only when it has been decided that there is no one within the division of vacancy who is eligible or ready for promotion."

There was striking agreement among stores that vigorous effort should be made to fill an executive vacancy from within the organization if possible. The stores with the most successful promotion-from-within policies anticipate promotions by having promotional material available—this material concentrated either in executive training groups or on up-to-date promotional lists. One store reported that it tries to have an understudy for each executive position. For executive material outside the organization, the following sources of labor supply had frequent mention: active application files, advertising in trade magazines and newspapers, personal contacts, recognized

executive agencies, schools, and colleges. For the actual filling of the vacancy, more than half the stores answering the questionnaire reported that the personnel department has the responsibility—not always the sole responsibility, however, since the personnel department in many cases works hand in hand with the divisional manager, general manager, superintendent, employment department, training department, member of the firm, or immediate superior.

The question as to how the new executive is brought into his job is an important one. Does he go through the regular employment channels, is there some other routine procedure, or is his installation more or less haphazard? We found half of our stores reporting that the new executive employed from without is routed through the employment office, is required to fill out an application form and is given the usual instructions by the training department. The other stores replied that while junior executives go through this routine procedure, major executives are not always routed through the employment department nor required to fill out an application form. For the most part, this group is handled by members of the firm, personnel director, store manager or merchandise manager. This raises the question as to what effect this variation in procedure may have on the prestige of the employment and training departments in the eyes of those executives who come in contact with these departments only after they have been on the job for some time. The effect that such discrimination may have on the worker himself may also be worth considering.

Are there definite advantages to be gained in the way of uniform explanation of policies, full information about the store and the job, by routing new executives via the employment and training departments? That is a point for each organization to decide.

FAMILIARIZING THE NEW EXECUTIVE WITH THE STORE AND THE JOB

While there may be a difference of opinion in regard to the value of routing executives through the employment office, there can be little doubt of the importance of the proper introduction of the new worker to his job and the store itself.

Let us assume, for sake of example, that we have the new executive definitely employed. What next? What happens in the interval between reporting to work the first day and actually starting on the job? To whom does the new executive report first? Where does he go next? Is he put to work in his department immediately after reporting to the store? If not, how long a period elapses and how is the time spent? What occurs in this "strange interlude" anyway? Do you actually know what happens in your organization?

While more than half of our stores reported some formal period of time given over to the orientation of the new executive, the length of this period varied from one day to three weeks, dependent largely on the type of position held. To quote one store as an example: "Buyers may spend a week in the training department. Section managers spend ten days. Non-selling heads usually a week, and research men five weeks." In another

store, "the new executive starts to work immediately, but his hours are so arranged that, during the first few days, time is allowed for conferences with the training department. There is an exception to this plan in the case of section managers who sell for the first day and then take training and do observation for a period of a week."

We found in most cases that the new executive reports to the divisional head. Frequently, however, we found him reporting to the store manager, superintendent or personnel department. He goes through the time office and medical department routines.

The important point, of course, is that the new executive actually has something to do at the start while his interest and enthusiasm are fresh, and that he feels himself on the job as soon as possible. In other words it is essential that he get a sense of organization and procedure right from the first.

How can a new executive be made acquainted with his organization? The following list of practices may be of service in taking inventory of this point:

- Giving the new executive a policy talk or booklet, a tour, directory, or system instruction
- Introducing the new executive to department heads and top executives
- Systematically routing the new executive through major departments, having him spend an allotted time in each
- Turning over to the immediate superior the responsibility of acquainting the new executive with the organization
- Acquainting the new executive with regulations regarding entrances, elevators, systems, dress regulations, etc.
- Giving the new executive the "low down" on personnel in his department or throughout the organization

Perhaps even more important than the introduction of the new executive to the organization is the problem of making him feel at home on the job. In our store survey questionnaire we listed a question on methods of making new executives feel at home. Out of the twenty-six stores replying to this question:

- 26 checked—providing him with necessary equipment (such as desk, table, forms, etc.)
- 25 checked—showing him his locker or place to keep his belongings
- 24 checked—introducing him to every member of his department
- 22 checked—telling him of any meetings he is expected to attend
- 14 checked—initiating him into specific organizations (such as buyers' clubs)
- 15 checked—telling him the order of events for the first day; allowing latitude in dress regulations
- 13 checked—providing a congenial lunch companion for the first day

Additional methods suggested were:

- Offering special shopping privileges
- Giving the executive a write-up in the store paper
- Introducing him to major executives
- Asking training supervisors to make an effort to speak to new assistants about progress
- Having different executives visit the department to see and speak to the new executive

As an accurate measure of performance a check-list is, of course, open to criticism. In checking such a list, we unconsciously check the items we believe in rather than the practices we actually know to be in use. If you are of the opinion that your organization puts into practice all it professes, it may prove enlightening actually to check up on this by questioning re-

cently appointed executives on these points.

An official announcement of one's position, whether it be at a conference or on a job, certainly avoids a lot of explanation and embarrassment. I am glad to say that practically all of our stores reported that some formal announcement is made of the filling of an executive position. Such announcements may be made through the store paper, weekly employment office notice, memorandum from a high executive or announcements at meetings.

In direct line with the problem of making sure that this introduction of the executive to the store and the job is actually carried out is the problem of discovering how much the executive gets out of this induction. Follow-up is weak in many organizations. In this particular instance it proved to be especially weak. We found that very few stores use any form of test, only two have a definite schedule of check-up interviews, while the rest have either no plan or else depend upon the ordinary daily contacts of superiors for check-up.

INCENTIVES OFFERED THE NEW EXECUTIVE

Let us turn now to the types of incentives that are offered new executives. From a list of about twenty possible incentives, more than half the stores stated that they had seen the following incentives used successfully. I will give them in order of frequency.

- Chance to take on additional responsibility
- Opportunity for specialized training
- Chance to learn under exceptional executives

Chance to identify oneself with an organization of recognized standing
 Promise of raise after success on the job
 Bonus in addition to salary
 Chance to help people
 Chance to broaden outlook by means of contact with other organizations, trips, conventions, etc.
 Chance to capitalize on college or technical school training
 Chance to work with considerable degree of independence

poses of discussion we may classify them under five headings:

Securing proper introduction to the job
 Establishing prestige for the new executive
 Sustaining the interest of the new executive
 Controlling outside factors that influence efficiency
 Miscellaneous

I wonder how many of you would agree with this selection for your own organization, or what additions you would make.

It is interesting to see that chance to *take on additional responsibility* heads the list of incentives when we actually analyze the amount of latitude allowed the new executive for displaying initiative in the early stages of the job. The amount of latitude varied from expecting the new executive to follow plans as outlined through giving him lee-way in carrying out plans already outlined, asking him to cooperate in making and executing plans, to giving him an entirely free rein. I am not holding any brief here for the amount of latitude that should be allowed a new executive, but I wonder whether there is not a definite relationship between responsibility and initiative. If so, it will repay us to check up on our use of "chance to take additional responsibility" as an incentive against our provision for opportunity to show initiative.

PROBLEMS MET IN ORIENTING THE NEW EXECUTIVE

Problems met in orienting new executives are many and varied. For pur-

It would be possible to devote a whole hour to this topic alone. At this point, however, I shall only cite some of the problems which seem particularly significant. Since the majority of the problems listed by our stores fell under the first two headings—securing proper introduction and establishing prestige—I shall confine my illustrations to these two groups.

Under *securing proper introduction to the job*, we found such problems listed: of "trying to change the title 'buyer' to 'department manager', and even more difficult, trying to change the frame of mind that goes with it." While this problem is phrased in department store language, it has its counterpart in any organization. We might re-phrase it thus: "trying to make the new executive personnel-minded." Another—"helping the new executive to break off old system habits, especially that of expecting some one else to make decisions for him." This example again brings initiative to the fore. Looking at it from another angle, we find one store having difficulty in making the people in the department acknowledge the introduction of a new executive with enthusiasm.

Such a situation leads directly into the big problem of establishing prestige.

Executives who are noticeably younger than their subordinates or those who do not have particularized knowledge in their departments or who have been transferred constitute problem cases in proper introduction to establish prestige.

While the problems of induction are numerous, they are surmountable. The first step in meeting them, of course, is to recognize that they exist. Once they have been brought out into the open, they may be analyzed and solutions for them discovered. The same thing can be said for the whole induction problem in an organization. It is necessary to discover first what kind of an induction job is being done and then to consider what improvements, if any, can be made, the latter to be determined by referring to other practices either in current use or that may be developed.

As a guide in taking induction inventory, we prepared a check-list of possible induction methods of introducing the new executive which may be used in setting up or revising an induction program. The check-list calls for a "yes" or "no" answer to each question. The list is as follows:

I. *Procedure followed in employing the new executive*

1. Do we plan to have promotional material at hand to fill any executive vacancy?
2. Do we have our promotional material readily available, in executive training groups, or on promotional lists?
3. Do we make use of as many sources of labor supply as we profitably might?
4. Do we have a definite line-up of persons responsible for the various steps in filling an executive vacancy?
5. Does a survey of the percentage of executive positions filled within the

last two years by employing someone outside the organization indicate that we should plan foresightedly to have more promotional material within our store?

6. Do we have a systematic routing through employment office, and training department for the new executive?

II. *Familiarizing the new executive with the store and the job*

1. Do we have a definite program for the training and orientation of the new executive, during the interval between his reporting to work on the first day, and actually starting on the job?
2. Do we use all possible methods of acquainting the new executive with the organization?
3. Do we use all possible methods of making him feel at home?
4. Do we give enough importance to the announcement of the new executive's name and position?
5. Do we have a definite line-up of persons or departments responsible for the induction of the new executive?
6. Do we have an adequate follow-up on whether or not the new executive is becoming familiar with the organization and his job?

III. *Incentives for the new executive*

1. Have we given enough thought to the importance and value of definite incentives for the new executive?
2. Are we emphasizing all the incentives that we profitably might use? Are we over-emphasizing any?

IV. *Problems met in orienting the new executive*

1. Is every new executive in our organization properly introduced to:
 - his superiors?
 - his co-executives?
 - the people under him?
2. Does every new executive receive at once, and in usable form, all the figures, information and plans needed?

In conclusion, may I suggest that, while the particular study that I have

described relates specifically to the induction of the new executive, the induction of the rank and file is equally as important and worthy of study. Furthermore, it is an angle which is frequently neglected. Consequently, even after we have solved satisfactorily the problem of the induction of the new executives in our organization

we may still have the big job ahead of us of training these same executives, in turn, to see to it that those working under them are properly oriented. Only when such a condition exists can we feel that we have a thoroughly efficient and effective induction program.

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Vocational Interest Blank as an Aid to Interviewing*

BY SADIE MYERS SHELLLOW, *The Milwaukee Electric Railway and Light Company*

Dr. Shellow is well known to readers of the PERSONNEL JOURNAL through her research on diagnosis and cure of accident proneness among motormen, and employment tests for selection of safe operators.

The Strong Vocational Interest Blank, apart from its usual diagnostic purpose, is a valuable aid to interviewing. In addition to being a good means of establishing rapport, it reveals hints of personality traits, interests, and motivating forces that may be probed further in the course of the interview.

This paper also reports a study in which a group of thirty executives and one of thirty non-executives filled out the interest blank. Total scores showed a marked difference between the groups, the median of the executives being + 43 and the median of the non-executive group -24.

NO MATTER to what extent objective measurements of special abilities may be developed, the personal interview will still have its distinctive place in personnel work. Piecing together test results can never give an adequate picture of a total functioning personality. In order to select properly a new employee or study the reasons for failure or success of an old one, more must be known than the stark ability to do the work. The question is not only "Can this person do this job?" but "will

he do it to the best of his ability, day in and day out?"

Interest, motivating forces, objectives, determine to what extent a person will apply his gifts. Although there have been many tests worked out to tap these fundamental sources of energy, interpretation of results must always be checked against actual perception of the personality functioning as a unit. This occurs during an interview.

Much has been written about the art or science of interviewing. Each investigator uses a different method, depending upon his or her own personality. The interview is a dynamic situation, in which the traits of two diverse personalities come into juxtaposition.

* Presented at the Ninth Annual Fall Conference of the Personnel Research Federation. The author is indebted to Carroll L. Shartle for the statistical work done in this paper.

position and intersect. Often the interviewer loses sight of the fact that his personality is conditioning the subject to at least as great an extent, if not greater, than his own impressions are being formed of the person he is interviewing. To keep the interview as impersonal as possible and yet to delve into the utmost sources of personality—fundamental motivation—is the real problem of the interviewer.

Much time is often lost in establishing the "rapport" necessary to get a subject to "open up and talk about himself." The question method only too often builds up reserves, puts the subject on his guard, rather than releases him. There has been a great need for some kind of a special technique which will quickly throw the interview into channels revealing the likes and dislikes, interests and ideals of the subject without arousing the protective mechanism which so often camouflages reality.

For the past three years, the author has experimented with the Vocational Interest Blank of Dr. E. K. Strong, of Stanford University. It has been used, not as an aid in vocational adjustment, but as a means of opening up an interview. After the shortest kind of preliminary interview in which the fundamental facts concerning the subject have been obtained, and a feeling of friendly interest established, he is given the blank and told to go through it quickly, not giving too much thought to any item, but recording his first impressions only.

Most subjects find the blank of real interest. One can safely go on the theory that every one is especially interested in his or her own likes and

dislikes, and since there is no catch to the situation—the subject is not asked what he thinks he *can do well*, but simply what he would *like to do*, there is little danger of conscious falsification. The items, moreover, are so varied and numerous that inconsistencies will quickly bring to light the uncertain or unstable person as well as the prevaricator.

The blank is divided into eight sections:

- Occupations,
- Amusements,
- School subjects,
- Activities,
- Peculiarities of people,
- Order of preference of activities (indicated ideals of type of work, motivating forces, and accomplishments),
- Comparison of interest between two items (this section checks very well with the analysis of the former sections and serves as a summary),
- Final rating of present abilities and characteristics.

QUANTITATIVE ANALYSIS

In looking at part I the first impression one gets is of the proportion of likes, indifferences, and dislikes. If one notices a large number of items marked indifferent—so large that there are only a few sparsely scattered likes or dislikes, one may assume one of the following causes:

Apathy—that is a general low emotional tone, a person not easily stimulated, without much enthusiasm, and with narrow interests and background.

Lack of imagination—the subject cannot visualize the occupations in sufficient detail to know whether or not they might appeal to him.

Lack of self-confidence—he may have misunderstood the directions and checked only those things which he thought he could learn to do.

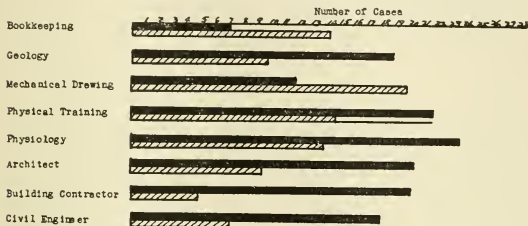
A *one-track mind*—so completely absorbed in his own field that he has no interest in anything else.

Lack of adaptability.

The function then of the interview is to determine which of these possible

shut-in. As the examiner goes over the blank with the subject, discussing the various items which throw light upon personality traits, asking the subject why this was marked in such a way, the subject opens up more and more,

EXAMPLES OF LIKES



EXAMPLES OF DISLIKES

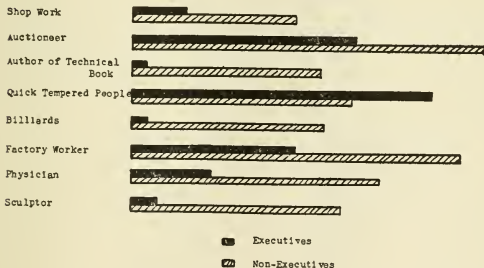


FIG. 1. SOME LIKES AND DISLIKES OF EXECUTIVES COMPARED WITH THOSE OF NON-EXECUTIVES

causes is operating. By answering the blank the subject has already "given himself away," offered to the examiner a picture of much of his personality, and no longer feels shy or

giving examples from his past experience (early childhood reactions and difficulties met in other jobs or present one) which examples may prove to be very revealing. During this process,

the interviewer has an opportunity to rule out those causes which obviously cannot be operating and is guided more and more definitely to the correct solution.

After considerable experience in using the blanks in this way, the examiner comes to discover reasons other than those which he had at first assumed as causing the different proportions in likes, dislikes, and indifferences.

In the same way one may run through the other parts of the test. A large number of likes under recreation, may show ability to play in different levels or fields. Many dislikes under school subjects, and very few likes, suggests a dislike for formal mental work; under part IV range of activity is suggested; under part V a greater number of dislikes than indifferences or likes might indicate a person hampered by many personal prejudices, one who makes snap judgments about people on the basis of rather superficial first impressions.

It should be noted that in each case the words "suggest" or "might denote" have been used. The markings on the blank are only a clue, a hint for further probing, a clearing of the decks; it is impossible to lay down rules and say that these markings do absolutely mean so and so, for the same picture may be interpreted in two different ways according to two different personalities. It is the further questioning on the basis of these revelations which discovers the true cause.

QUALITATIVE ANALYSIS

The blanks reveal not only how many activities or interests the subject has, but their nature as well. The

items are so varied and scattered that a "halo" effect is avoided and yet at the same time there are many items so related as to form complements and supplements to each other.

In order to understand more clearly the way in which the analysis is made, a sample case will be presented. This is the case of Miss C, who was working in a retail sales department and whose work was of such a poor caliber that she was about to be discharged. The subject was sent in for interview in order to see whether or not there might be some other place in the company in which she might fit, and also to discover why she had not made a good sales person. The first thing we notice is the large number of indifferences as compared with the likes and dislikes. We have noticed that there is very little expression on her face in conversation, very little animation, and that she does not respond with any enthusiasm to pleasant well-directed questions. We suspect apathy, but let us consider at least along what lines she is interested:

- Athletic director
- Civil service employee
- College Professor
- Explorer
- Laboratory technician
- Librarian
- Musician
- Music teacher
- Office clerk
- Office manager
- Orchestra conductor
- Pharmacist
- Photo engraver
- Physician
- Printer
- School teacher
- Scientific research worker
- Social worker
- Surgeon

There are several common elements running through the occupations selected. Athletic director, factory manager, office manager, orchestra conductor, school teacher, all of these suggest that she would like to be in charge of a group, to have a certain responsibility over other people. Explorer, laboratory technician, pharmacist, physician, scientific research worker, surgeon, show an interest in science, and intellectual curiosity. Then there are musical and artistic trends. Her dislikes upon analysis show no common trends. Toward everything else she is apathetic. In asking her why she would not like to be a bookkeeper, for example, she says that she detests mathematics, has never been able to do them, and dislikes the clerical work involved in her job in selling. In asking her why she would not like to be a factory worker, she says she does not like to do the same thing everyday. In questioning her as to why she thinks she would enjoy scientific research, she asserts that she likes to be independent in her work and resents supervision.

Thus with just a few questions is revealed an attitude toward work and the fundamental desires of her nature. One might run through the entire picture, showing in what way her interests are further revealed, but one or two other sections, however, will throw sufficient light to serve as a good example for this method of utilizing the blank. Let us look at her reactions toward people. Here we find eleven likes, twenty-four indifferences, and seventeen dislikes. She is not a person who enjoys social contact. She tends to be either indifferent or to dislike the people whom she meets.

Under part VIII we find that she rates herself down on many qualities—initiative, self-confidence, shows oversensitiveness, lacks resourcefulness, tends to be gossipy, is not punctual, does not plan her work in detail, lacks animation and energy. The total picture shows a general lack of self-confidence. Further her feelings are easily hurt, she is only fairly considerate, she dislikes being supervised, and tends to make alibis when caught making a mistake. From the above sketch it is easily seen why Miss C did not make a good sales person. She had neither the physical vitality, the interest, nor the desire to do the job, there was an apathetic reaction toward people and a certain feeling of superiority, which she had, since she wanted to do creative scientific work and was doing what she considered a very mediocre kind of dull, routine work.

An advantage of this method of interviewing is that the interviewer tells the subject nothing about herself except what the subject has herself admitted and so when conclusions are drawn, she is usually convinced on the basis of her own evidence.

DIAGNOSING EXECUTIVE ABILITY

Last year, the author gave a course to executives in "Development of Personality," the purpose of which was to point out certain psychological mechanisms most frequently met with in executives in their relations to their workers. Part of the course was devoted to a personal interview with each executive and discussion of specific problems. The Strong blank was used as a basis for this interview. There were seventy-five sub-executives in the group. Of these, thirty were

selected who were rated as "good" executives by three or more members of a department which had an opportunity to judge their work. These thirty blanks were then matched with thirty others obtained from a class of clerks, stenographers, etc., who had not thus far shown any signs of executive or supervisory ability.

Outstanding differences were discovered among the two groups, so much so, that various items on the blank could be marked with weighted grades indicating their presence or absence in the supervisors' group as compared with the other mixed group.

The frequency of the likes and the dislikes of the two groups was noted for each item. A like or a dislike that was marked by a larger number of executives was scored from +0 to +4 depending upon the amount of difference between the groups. Likes or dislikes marked by a larger number of non-executives were given negative weights. The 60 blanks were scored with the following results:

	RANGE	MEDIAN	QUARTILE DEVIATION
Executive.....	- 48 to +74	+43	16
Non-executive....	-112 to +32	-24	30

In summarizing the outstanding interests of the executives as compared with the non-executive group, we find

the executive to have a decidedly creative attitude as compared with the subordinate attitude toward work, and to be drawn toward those jobs which are supervisory in their nature. In his abilities he lists as outstanding: initiative, steadiness, ability to get others to do as he wishes, resourcefulness, ability to stimulate others, ability to maintain discipline, tact, and judgment. He worries very little, is conservative, enthusiastic, and respected. In his study he enjoys subjects involving mental discipline, prefers working with people, and in a supervisory capacity, he enjoys self-expression both verbal and written. He has few prejudices when compared to the non-executive group.

CONCLUSION

The great value in the use of the Strong blank in interviewing, aside from its diagnostic possibilities,¹ is the steer it gives one in the interview, the ease for approaching difficult subjects, the mechanism for making the subject rather than the interviewer do the talking, and the wealth of detail of background which it reveals. With such a picture it is much easier to fit an individual into an organization, and feel fairly sure of his or her motivating trends.

Manuscript received November 15, 1930

¹ Strong has worked out keys for many vocations.

Training for Hotel Service

By JOHN C. BURG, *Hotels Statler Company, Inc.*

Personnel procedures are being carried over into a comparatively new field, that of the hotel industry. Mr. Burg tells how one hotel is adapting these procedures to its own peculiar problems. He approaches the subject of training employees from the background of six years of personal experience with the Statler System.

Concerned chiefly with the development of the right attitude of guest or customer-contact employees toward the public, this paper first traces the origin and evolution of the service idea in the hotel business. Then the methods used by the Statler organization in training employees for such service are described. The training program is based on analyses of complaints and analyses of the various jobs in each department.

SO THAT we may clearly understand my interpretation of the title of this paper I want to say in these introductory remarks that I have approached the subject having in mind the training of guest contact employees. Hotel men will know that in this connection I am thinking primarily of the training of employees in the rooming staff, bell boys, elevator operators, front office cashiers, floor clerks, mail and information clerks, waiters, telephone operators, etc. I am, in fact, limiting the idea of service to the acts performed, the words said, and the attitude taken by the hotel employee in his dealing with guests in the house. Although reference will be made to the training of employees in the so-called technical details of their jobs, the primary emphasis will be laid on the methods used in developing an attitude toward the public by hotel

employees so that they will not only not offend the public but will actually take positive steps to *please* the public. There is a difference in the training for service and the training for the job which requires a knowledge of manual operations.

When I was a boy in the packing room of the Western Electric Company, it was there through instruction that I learned how to wrap pieces of electrical equipment and pack them in boxes or barrels with the proper protecting cover of excelsior. After a while I acquired a certain degree of skill in this performance. However, dealing with the public requires a technique entirely different, but none the less skillful. The effect on an individual after training him for service sometimes approaches a reformation. Many an employee who has been unaccustomed to meeting the public, who

is not familiar with the courteous amenities of social life, who because of diffidence or perhaps of an innate surliness, must be made to appear, in his outward expression at least, to have the courtliness and friendliness of a well bred man. Methods of selection should make it possible to avoid hiring such employees, but this cannot always be helped. You cannot get a college graduate or a social Beau Brummel to run elevators. At least, you can't under normal circumstances, present conditions excepted.

In the following discussion of training for service, I want first to review briefly the development of the idea in the hotel field.

I feel safe in saying that no hotel, during the first decade of this century, was operated according to modern service ideas. There were, of course, a few outstanding hotels which were quite successful, but most of the hotels of that day, including many of the so-called hotels of class, had no policy of service commensurate with what is expected today. Whatever ideas of service they had were often embodied only in the spontaneous action of the hotel keeper or his employees, which took the form of simply greeting a guest courteously and of not antagonizing him until or unless he gave provocation. The service of some hotels of today may still be on that level.

These spontaneous actions, however, represented the crude beginnings of what is now an elaborate service structure. The other day we were looking over some old papers, written when Mr. Statler planned the Inside Inn at

St. Louis in 1904. We became interested most in a paper which contained in his own handwriting the platform or code of policies which he had drawn up then and determined upon as the basis of service to the guests of that hotel. Apparently, the code was sound for it has become the basis of the service policies upon which all Statler hotels are now operated. Here is what he wrote in 1904:

1. "The policy of this House is to please."
2. "No guest should be permitted to leave this house displeased."
3. "No employee is to be retained who cannot please."

It was a simple code, I will grant, and perhaps now will sound a little crude to you, unless you can for the moment think yourself back in 1904, before the service idea in industry began to develop.

The policy to "please" made itself evident in certain physical comforts and conveniences as contrasted with the personal services of employees. It was the germ of the idea of a bath with every guest room, an innovation which was introduced in the first Hotel Statler, built in Buffalo, in 1907, which became popularized by a slogan: "*A Room and A Bath for a Dollar and a Half.*"

Each guest room of the first Hotel Statler was also provided with circulating ice water, another improvement adopted to remove annoyance and inconvenience to the guest of telephoning, waiting and tipping for a pitcher of ice water, whenever he craved cool water to drink.

Other service developments in con-

nection with construction and equipment followed. I shall not attempt to go into details but some of them are:

Placing key hole above door knob instead of hiding it underneath.

A full length mirror in every room.

Pin cushion on the dresser in every room—with needles, thread, buttons and pins.

Plentiful supply of writing materials in every room.

Liberal fixed pars for room linens, towels, etc.

Bedhead reading lamps.

Elimination of unrequested service in public wash rooms.

Morning newspapers under the door of each room, so that the guest can read the news immediately upon arising.

Servitors in later hotels.

Radio in each guest room.

If you will read deeply enough into that old platform written in 1904, you will see that all of these physical conveniences and all of the efforts introduced in behalf of the physical comfort of our guests have grown out of the first plank of the platform, namely: *"The Policy of this House is to Please."*

However, after all is said and done, the development of physical conveniences and comforts in construction and equipment, will at most form only the foundation for the service structure of the business. We know that in the hotel business nothing will take the place of friendly, courteous, interested, helpful, trained employees—the "servants of the house"—and this personal or human side of our service requires constant attention. It is our greatest problem.

Little was demanded in those early days. Then service ideas began to grow. The second plank of Mr. Statler's platform changed a little as the

years went on, and later read as follows: *"Satisfy the Guest or Refer him to Your Superior."* The latter part—"refer him to your superior"—was added as a simple rule of action for employees, designed to guarantee satisfaction to the guest by insuring his contact with the final authority. If a guest complains to an employee and that employee cannot immediately satisfy him, then he has only one thing to do. He must courteously put the guest in touch with his superior. This same idea took another form *"The Guest is Always Right,"* used primarily to bring home to our employees the fact that as far as they were concerned, they, in their relations with a guest could assume nothing else but that he, the guest, was right. With such a declaration coming from the president of the company over his signature each employee began to learn that he had no right to argue with a guest, but that his job was to serve and satisfy. Distinctly these slogans became powerful instruments for training employees in the handling of at least that part of the public requiring more than routine attention.

And now, in our current literature, you will find that same idea embodied in the statement appearing over the name of Mr. McKowne, our President, which reads as follows:

"We recognize your right as a guest to a courteous, interested, helpful service from every Statler employee, and we guarantee satisfaction, even if it becomes necessary to refer the transaction to the executives offices." F. A. McKowne.

Thus, an all-the-way policy developed, of courtesy, patience and tol-

erance under provocation, of interest-ness, graciousness and helpfulness, and along with all of that, the newer, larger idea that service did not require "fussing" over guests, nor being obsequious, but trying in all sincerity to meet their whims as well as their needs. We have found that to apply the Golden Rule in all transactions is an essential in rendering the service we desire our people to give. That idea shapes itself into a policy called "Our Golden Rule of Service," which reads as follows:

"To treat our patrons and fellow employees in an interested, helpful and gracious manner, as we would want to be treated if positions were reversed."

But, if we had stopped at a simple declaration of service policies, as essential as they are, it would be like outlining a plan of action but failing to take the necessary steps to make that plan effective.

We were not long in discovering that our policy to "satisfy the guest" after he had been subjected to some annoyance or unpleasantness, was, after all, merely "to lock the stable after the horse was stolen," that it was far more to the point to *prevent* these disturbing occurrences.

Therefore, it became necessary to find means to reduce the complaints which were positive evidence of faulty conditions within the organization. We set up a plan of getting a report of every complaint, and then began to regularly analyze *all* complaints to ascertain definitely the causes in order to discover and adopt methods by which the causes of the faulty service could be eliminated.

I know you are not unfamiliar with this idea of prevention, for it has been applied in various ways in many businesses beside ours, but you will, perhaps, be interested in some of the things we do. It was very evident that most troubles arose at the points where guests had contact with employees. Employees needed training and instructions along three lines.

1. A detailed knowledge of their jobs.
2. How to do their jobs.
3. How to fit their jobs into the needs and requirements of each particular guest, because as a matter of fact each guest requires a little different treatment.

Or, stating this another way, employees required training and instruction as follows:

1. An understanding and skill in the technical details of their jobs.
2. An understanding of the full meaning of courteous, helpful, unusual service.

It was no simple matter to prepare the necessary material to give instruction to the employees. The intricacies of a job in a large, modern hotel, are many; but we have undertaken primarily as a means for instructing employees, and also a means of keeping our methods modern and eliminating waste of effort and expense, a survey of every department and an analysis of every job in the department.

I have just completed such a survey of our mail and information department where we had forty-three employees assigned to eighteen different jobs. In this analysis we followed the course of the different classes of mail, telegrams, notes, and messages, which

came into that department for guests, non-registered persons, and for members of the staff.

Then we followed the course of each arrival slip, forwarding address, and other necessary records, clearing through that department. We then took each job, and sitting down with the employee, the supervisor, and the superintendent, we analyzed exactly what the employee holding that job did throughout the day, and what equipment or machine he used and how he used it. Later, with this background of knowledge, we went over the problems of the department with the department head and the manager, and as a result we believe that we have made changes in equipment and methods which will tend to improve the efficiency of the work and the service by that department to our guests. Certainly we have succeeded in making material reduction in the cost of that department. Now, out of this analysis we have secured a very carefully prepared description of each job, and with this description we have gone to the old employee, and have carefully explained to him or to her what the analysis of that particular job contains. As a new employee comes into the department, we use that analysis in describing to her or him the duties of the job to which that employee has been assigned.

We have not, of course, forgotten that the best way to teach is by actual demonstration by someone capable of carrying on such instruction, but these analyses have been extremely useful in developing a plan of actual demonstration, and in clarifying every detail of operation.

Briefly, some of the other devices which we use to show the employee how to handle the technical details of the job, and to give the employee a full meaning of courteous, helpful, and unusual service are as follows:

1. Manuals of instructions for each employee with a plan for their use.
2. Meetings by managers with department heads.
3. Meetings of department heads with their employees.
4. Messages on service ideas and morale.
5. Inspection by functional men expert in their respective lines, and through outside agencies to give us the average experience of our guests.
6. Then, use of the complaints to show wherein the employee failed. These come from five sources.
 - a. Service or complaint reports referred to above.
 - b. Questionnaires designed to discover what our guests wanted and wherein we failed to serve them properly.
 - c. Letters from guests.
 - d. Interviews with departing guests by assistant managers.
 - e. Interviews by our salesmen with prospects upon whom they are calling.

In addition to the above we have continually emphasized the importance of a selected and trained organization. We have set up machinery for selecting the types we must have. And to aid us in the retention of trained employees, we have used benefit and welfare plans, including free life insurance, group health and accident insurance and a savings plan to which the Company makes a contribution permitting the employee, if he so desires, to convert his savings into stock ownership.

Shortly before his death Mr. Statler

summarized the policies of the company, stating them as briefly and simply as possible, so that all Statler employees could understand them. They were printed on a small card and the employees were given instructions to carry them. This code was another instrument for training. These brief guides are applicable, I believe, to any hotel or other business. I will give them in full:

Our policies

1. To treat our patrons and fellow-employees in an interested, helpful, and gracious manner, as we would want to be treated if positions were reversed.
2. To judge fairly, to know both sides before taking action.
3. To learn and practice self-control.
4. To keep our properties—building and equipment—in excellent condition at all times.
5. To know our job and to become skillful in its performance.
6. To acquire the habit of advance planning.
7. To do our duties *promptly*.
8. To satisfy all patrons or to refer them to our superior.

E. M. Statler.

Included in this code are the aims of our efforts to train employees for service; that is, to treat the guest graciously and to satisfy him and know our jobs so well that fair treatment and satisfaction to the guest is practically guaranteed.

The machinery for accomplishing such results in a large organization takes time to build. But, machinery or no machinery it is not the right attitude of the employee that is most important but *it is* the right attitude of management. If management is right in its attitude toward the public,

then a rank and file trained in courtesy and service can be developed. But, lacking the right attitude on the part of management, it is futile to hope for an organization trained for service. From the management emanates the pervading influence—good or bad—that finds its way down to the lowliest buss boy, dish washer, or maid. No amount of training for service can equal it in effective power. If this influence is right, the organization will probably be good. If it is not right there is no hope that the organization will render adequate service.

Moreover, it is not only the right attitude on the part of the management that is necessary; his active interest in the training program is just about essential. It is easy for the manager to follow his daily routine of the ordinary operations of the hotel in which he has become expert. He will watch these operations closely enough, because the results of these operations—good or bad—show in the black or red at the end of the month. But, the manager usually finds the methods of training employees something new in hotel operation, something with which he is not altogether familiar and his unfamiliarity with these methods tends to keep him away from a close consideration and use of them.

Furthermore the results of the work done in the training of employees cannot be traced directly to the ledger. It takes a manager of vision with faith in the processes of education to comprehend the values of a training program. Fortunately such men are being developed and the number at

the head of hotels and hotel companies is increasing. This gives me reason to believe that hotel service, as good as it is now, will be better as the years go on, and that improvements will come largely because of the intelligent application of programs for training hotel employees. I know there is a question in the minds of some as to whether the efforts made in thoroughly training employees along these lines is good business, or is worth the cost. I am positive that it is profitable busi-

ness. But, profitable as it may be it has another value which we hotel men appreciate. The superfine service of a successful organization, which I believe can be developed by proper supervision and training, gives to the management a sense of satisfaction that no money can buy. This too is worth something and should be included on the credit side when the expenses of operation are being considered.

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What the Scientists Are Doing in Personnel Research

BY ALBERT EDWARD WIGGAM, *New York*

Dr. Wiggam, lecturer and writer, has long watched the strides of the biological and psychological sciences, and interpreted to the American public the social significance of notable discoveries. In this address, delivered at the annual dinner meeting of the Personnel Research Federation, he tells in happy vein about the advances which scientists have made in knowledge of human nature as related to industry and occupational adjustment.

WHEN I was first asked to review what scientists are doing to adjust human beings to their work and adjust work to human beings, I at once inferred that I was honored with a request to deliver fifteen or twenty lectures before a body of freshman students; but instead I find, to my genuine alarm, I am to speak fifteen or twenty minutes to a body of experts who know far more about the subject than I do. I fear both your Director and the audience are very much in the false state of expectancy of the young woman who said to her physician, "How soon will I know anything, Doctor, after I come out of the anesthetic?" "Well," replied the doctor, "that's expecting a good deal from an anesthetic."

However, there is one bit of research that I believe even I, as a sort of home-made, lay psychologist, may contribute to the present symposium. At least I thought I was considerably interested in psychology until recently I was breaking in a new stenographer

who had evidently not been selected or trained by the best personnel methods, when I dictated a letter to a western scientist in which I said, "I am incidentally interested in psychology" and she wrote it, "I am indecently interested in psychology!" But for some twenty years it was my profession to lecture throughout the United States at lyceums, Chautauquas, high schools and colleges on various human and social aspects and applications of science. Since during those years I addressed upwards of five thousand audiences, including perhaps a million people, and traveled at least 300,000 miles throughout the country, one of the magazines recently requested me to prepare an article on what I had learned about the American people from this experience. They suggested the title, "What Do the American People Most Want to Know?" and the editor elaborated this with the inquiry, "What is the one question that you have been asked most often by the people and audiences

you have met?" I instantly replied, "If the inquirers are parents, the question that outranks all others in frequency is, 'What help can you give us in advising our boy or girl as to a choice of a life work?' If the inquirers are young men and women the question is practically the same, 'What help can you give me in choosing the right vocation?'"

It seems to me this indicates that the research workers in this field and the increasing number of business men who are so earnestly coöperating with them are seeking by every method of science and by every procedure of business administration to answer the most insistent, persistent heart problem in the daily lives of our people.

And if I were asked what seems to me to be the chief single discovery you have made, I should say it is the discovery that *happiness is profitable*. When you mention this strange new science, called psychology, to the business man, he very naturally and properly asks, "Is there any money in it?" He can readily see whether there is money to be made out of a chemical discovery or a mechanical invention; but when a man comes along without any overalls on, or any grease on his fingers or machines or chemicals in his hands, and tells him there is money in making people happy, his first thought is that you mean giving them higher wages, more excursion tickets to Coney Island and more summer picnics. He naturally views such a man with alarm. This type of business man forgets, or else has never known, that the chief reason why slave labor did not pay was because the worker was unhappy. And the slave was unhappy and a poor

worker not so much because he received no wages and no Coney Island excursions as because, first, his sense of self importance—perhaps a deeper urge in human nature than hunger or the sex instinct—was crushed; and, second, there was no provision for individual differences in interests and abilities.

However, looked at historically, when the business man discovered slave labor did not pay, he thought to remedy the entire situation by a dole of money wages. During the past twenty-five years you psychologists have found out more than had been learned in centuries of experience, as to why this simple device does not solve the problem. It still leaves the deepest motivations in human nature and the special abilities each individual may possess for his most effective work unprovided for. What the business man usually ignored until you students of human nature brought it to light was not only that a man's special abilities often enable him to do some types of work twice or ten or a hundred times better than other types, and that some men can do some types of work twice or a hundred times better and more easily than other men, but also that a man is usually the happiest when his work requires his best special abilities—that he tends to like best what he can do best and do best what he likes best.

This discovery led you into a vast unexplored field of human nature, wherein you have found that a man's abilities are profoundly affected by his interests, drives, beliefs, hopes, passions, ideals—all those things that enter into a man's philosophy of life.

You have discovered that almost the most important thing about a man is his philosophy of life and that it is one of the most important things for an employer to know. It is for this reason that G. K. Chesterton says, that it is more important for a landlady to know what her boarder believes than it is to know his income. A man's beliefs about home, marriage, parenthood, money, sex, love, wages, destiny and God have a profound effect upon his work and upon the best or worst use of his special abilities.

Now, I have dwelt for a few moments upon these general aspects of human nature merely to bring into relief what seem to me to be the two broad fields in which the industrial psychologist has made signal progress. These two fields, while they greatly overlap, are first, the field of emotions, interests, passions, ideals and desires, and, second, the field of special mental mechanisms, skills and abilities. And probably the most significant aid to both worker and employer has come from your demonstration of the intimate inter-relationships of the two. I recall here that some twenty years ago I made a special trip into New York from up-state in order to ask Professor Thorndike if there were any relationship between a man's interest in an occupation and his ability to do it successfully. He said he thought probably there was but could point to only one brief research in support of this supposition. Now, you have a large body of data strongly suggesting that this is a broad general fact of human nature. Besides the researches of Fryer and others on interests and abilities

you have the investigations by Strong of Stanford, which by most ingenious devices bring to light both the recognized and unrecognized occupational interests of the individual. Strong's follow-up work, covering more than eight years, indicates a significant relationship between an individual's occupational interests and drives and his ability to do well at these occupations. These devices bring out with considerable clarity what I have termed an individual's ambition picture—the picture of what he sees himself being and doing five or ten or twenty years from now.

These interest pictures or ambition pictures of young people are being greatly clarified and defined by personnel studies of another kind, of prime importance, namely, the studies of occupations that are now being introduced widely into our schools, the most notable contributions in this field being the Cincinnati and Cleveland occupational surveys. Obviously a boy cannot have a very clear interest picture of an occupation he knows nothing about. Indeed, Dr. David Mitchell who has, by the general methods of clinical psychology, been very successful, both in guiding individuals into congenial occupations and in making them find new satisfactions and adjustments in the occupations they may happen already to be in, relates that he was recently endeavoring to get at the ambition picture of one unhappy young man but could discover no interest in a great many occupations that were mentioned. Finally the Doctor in despair said to him, "Is there anything on earth you would like to do or be?"

"Yes," the young man drawled with the most unconscious sincerity, "I'd like to be a retired business man."

Yet, I think in all seriousness this incident illustrates the enormous service the industrial psychologists can render to the youth of the land in first supplying them with sound descriptive data about occupations, these data then to be presented by the best methods that your colleagues, the educational psychologists, have devised; then with this background the counsellor can, with marked success, get at the real interests of the individual with reference to these occupations.

All this so far deals, however, with only the emotional side of the employee's makeup. In the other large aspects of employment selection, namely, the tests of special abilities and of what we now term, because we know so little about it, general intelligence, the devices are so numerous and so helpful that it would take hours instead of minutes for their briefest description. These efforts to get at a sort of general sample or cross section of all abilities have had a long and notable history. Beginning with Galton and more definitely Cattell, later receiving the stimulus of Binet and coming on down through Terman, Kuhlman, Spearman, and Thorndike, and the men who developed the Army Alpha and Beta and other instruments, the greatest success of recent years has been in the measurement of special talents and aptitudes. And here perhaps the most successful efforts have been achieved in the field of measuring mechanical aptitudes or abilities.

Notable work has been done in this department of experimental psychol-

ogy by Stenquist, Viteles, Thorndike and others. Johnson O'Connor's "wiggley blocks" have had rather a unique success in indicating mechanical and engineering aptitudes, and when expertly used are no doubt very helpful. Of especial note, however, is the 610-page large octavo volume recently issued, containing the Minnesota Mechanical Ability Tests. These are the outcome of a four-year research under the auspices of the National Research Council, of which Donald G. Paterson and Richard M. Elliott were directors, L. Dewey Anderson, chief investigator, Herbert A. Toops, statistical consultant and Edna Heidbreder, editor. As the authors state, the problems attacked in this research were, first; "The extent to which general mechanical ability may be said to exist and to be significant for successful adjustment and adaptation in our present social and economic organization; and, second, the effect of various specific factors in determining the several mechanical abilities and interests . . . including heredity, early training, social and economic status, race, age, sex and schooling." I agree with Dr. Robert M. Yerkes, it is difficult to write calmly and objectively of this report as it stirs our emotions by "its contribution of fact, method and insight and its promise of helpfulness in educational, vocational and industrial procedures."

But a man of imagination must have his emotions stirred by both the practical success and future promise of many other researches upon the adjustment of the individual to life and industry. Seashore's epoch-making work in measuring musical talent has

undoubtedly saved thousands, and we hope in the future may save millions of poor boys and girls whose musical talents are comparable to those of a wooden Indian, from being put through years of piano and violin practice to satisfy the social ambitions of fond but ignorant parents; and it has already discovered and will discover in the future many children with high musical abilities that are unsuspected. At this point there comes to mind, too, Terman's *Genetic Studies of Genius*, the galley proofs of the third volume having been only yesterday laid on my table; also Dr. Leta S. Hollingworth's fine research on gifted children—these two studies being most significant efforts to discover and promote the talented individuals in the population. One great value of these studies, particularly Terman's, is their long follow-up procedures. We have here a suggestion of what a great national program might do if we could collect such a mass of data for every child. What a joy it would be for a vocational counsellor or employment interviewer to have at hand a hundred typewritten pages of objectively collected and evaluated data, as Terman has, for every applicant for employment or for every boy or girl seeking vocational counsel!

Before leaving the selection side of industrial psychology, the man that sees that your mail is delivered promptly and that the men all along the line who have to do with its delivery are effectively and happily placed, and who has improved the civil service examinations in many fields, should be mentioned, your President Dr. L. J. O'Rourke. Not the least interesting

just now are Dr. O'Rourke's ingenious devices for measuring judgment and resourcefulness in prohibition officers. Let us hope he may devise tests of both the reliability and validity of the products for which the prohibition officers are seeking!

Aside from measuring the emotional drives and special abilities of the individual primarily concerned with finding the right employment, it is also difficult to speak calmly and objectively of the meaning of many of the special researches that have been made upon the human factor in industry after an employee has been selected. When I find, for example, two or three genuinely insane persons working happily and effectively in a department store, as a measure of mental therapy, their mental situation unknown to the customers and scarcely known to their fellow employees, persons who formerly would probably have been either burned as witches or chained in a dungeon, an achievement that has been accomplished by Dr. V. V. Anderson in Macy's; and when we find numerous other mental disturbances sympathetically treated and provided for in practical administration and all made to add to dividends, the whole field of psychiatry and mental hygiene and its enormous service in industry and society looms into view. It is such a large field I can merely mention it in passing.

Closely allied to achievements such as those just mentioned is the gratifying success of the large scale study made by your honored Director, Dr. Bingham and his colleague Dr. Slocombe, of the accident situation on the Boston bus and surface car lines. No

piece of work has dramatized more forcefully the economic as well as the human values of industrial psychology. Here, two distinguished psychologists put on their overalls and motorman's uniforms and went to Boston—or to be chronologically and sartorially more exact, went to Boston and then put on their overalls—and by elaborate procedures studied the human factor in relation to accidents. They pretty well eliminated the word "carelessness" and the phrase "A man's own fault" as being the primary cause of most accidents. What lies behind the apparent carelessness they soon found was their real problem.

For example, here is a man of sixty who is having frequent collision accidents and is about to lose his job. They find that eight out of eleven of his accidents occur just as he starts his car. Is this man simply careless? No, he is so conscientiously careful for one part of his work that he neglects another part. They find he is slightly deaf and listens for the starting signal from the conductor so intently that he neglects to look about in front of his car before throwing on the power. By a little training the man is taught a new habit, that of looking quickly from side to side instead of starting his car without this precaution. Thus the man keeps his job. He has never had a similar accident since. It is a temptation to relate numerous other cases but the net result of three years work makes a truly inspiring showing, namely, a reduction of about fifty per cent in the number of collision accidents, resulting in a cash saving of over \$300,000 in 1929 alone in the cost of accidents. Many men have been re-

educated for better work than they were already doing, and fewer men have been dismissed for accidents than before the research began. When dramatists are looking for new material and situations that stir the heart and the imagination I invite them to follow you industrial psychologists in many of your research excursions.

Certainly a dramatist would find inspiring material in the experiments carried on by Pennock and Putnam in the plant of the Western Electric Company at Hawthorne, Chicago. As I have mentioned, when your old type employer thinks of increasing the happiness of his workers his first thought is higher wages or more pleasure excursions. His second thought is better ventilation, better lighting, rest pauses, shorter hours, sanitary toilets, handy restaurants for hot lunches and the like. Putnam and Pennock investigated the weight of such factors upon the worker's happiness and effectiveness but found one single factor that out-weighed them all, namely, the *character of the supervision*, which took in not only the personal attitude and ability of the boss but also the employees' freedom of expressing opinions about the work and many other factors, largely emotional. They found the improvement in the mental attitude and the resultant increase in output of the workers was due more to their relative freedom from traditional exacting supervisory practices than to improved physical working conditions. As these students express it in substance, these observations suggest that any plan for improving the attitude of employees should begin with a consideration of

their likes and dislikes. As a practical method for doing this and making these likes and dislikes effective factors in the total work situation, three methods have been tried at Hawthorne for obtaining, applying and analyzing the worker's personal feelings, beliefs, irritations, interests and the like. These three methods are: (1) Giving the employee opportunity to talk freely and anonymously about his work or his boss or his home situation or wages or whatnot; (2) Submitting some of these anonymous interviews to the supervisors as a basis for *their* re-education; (3) Analyzing and classifying all such comments as a basis for future plant improvement and research study. I visited this work personally and came away with the impression that it was one of the happiest and most fruitful studies going on in industry. Professor Elton Mayo in a notable paper last year before this Federation pointed out the value of such researches in the work that he and a number of others have under way for improving the understanding of conditions affecting employee satisfactions.

You have already for two days listened to many fine and suggestive researches, and tomorrow morning you are going to hear of studies of great economic and public significance by Houser and Franzen, on the measurement of three types of attitudes, namely, employee attitudes, customer attitudes, public attitudes. I think, too, you will be glad to find in tomorrow's program the ingenious and helpful way in which Mrs. Shellow, of the Milwaukee Electric Railway and Light Company, utilizes the Strong Interest

blank as an aid in interviewing executives. It is one of the finest additions recently made to this phase of the technique of interviewing. It comes from a progressive firm which for years has successfully used psychological methods in selecting motormen, and in training them to safe operation.

Even the most cursory review of this field of science would be incomplete without mentioning the work of Thorndike and his colleagues on adult learning. These studies are bound to affect educational administration as well as industry. They bring home to the public the fact that education is a life long process, that age is scarcely any handicap to learning anything you want to know or need to know, and that, as Thorndike suggests, the best time to learn a thing whether at fifteen or fifty is "*just before you are going to use it.*" In the field of industry, the demonstrated capacity of older people to learn both new mental and motor habits will surely work a great change in the attitude of employers towards what Mrs. Douglas Fryer aptly terms "heart-break age"—that tragic time when an employer says to the applicant, "You are too old."

In closing this hasty sketch I am acutely aware that there are scores of eminent names and notable pieces of research that should be mentioned. The studies of Cowdery, Wood, Thorndike, Stoddard, Shuttleworth, Crawford, Doll, Brigham and many others on tests of collegiate ability, promotion and elimination, and the emotional adjustment of college students, have an industrial bearing. More directly, however, those of Bridgman and General Rees on success in college and

business, showing the predictive value of college scholarship and extra-curricular activities, are extremely valuable. The work of Snow and others on tests for automobile drivers; of Viteles on the human factor in sub-station operation; of Viteles and Gardner on women taxicab drivers; of Hersey on "Periodic Emotional Changes in Workmen;" of Achilles on "Applying Psychology to Managers;" and several studies of executives such as those of Joslyn and Taussig, Laird, Moss, and O'Connor; of Metcalf, Yoakum and many others on problems of management—well, it seems invidious to mention only these but they simply happen to come to my mind.

The researches of numerous foreign workers such as Lahy, Lipmann, Mira, Spielrein, Walther, Baumgarten, Myers and Miles, the significance of whose work I know chiefly at second hand, show the world-wide scope and interest of the problems involved in adjusting human nature and industry.

The editor of a great magazine which is devoted entirely to recording contemporary history asked me at luncheon the other day the astounding question whether there had been any progress made in psychology in the last twenty-five years! I told him his magazine could easily be filled for the next half dozen years with the briefest record of this progress.

Yet an inquiry such as this throws into dramatic relief the great value and need of popular books dealing with industrial psychology. Some excellent ones that come to mind are Dr. V. V. Anderson's "Psychiatry in Industry," Ordway Tead's "Human Nature and Management," Elliott Smith's "Psy-

chology for Executives," Kitson's "How to Choose the Right Vocation," Craig and Charters' "Developing Leadership in Industry," Hollingworth's "Vocational Psychology and Character Analysis," Poffenberger's "Applied Psychology," and Myers' "Industrial Psychology." These all go straight either to the business man or to the youth in search of counsel. Donald G. Paterson's "Physique and Intellect," is a fine piece of debunking of the hocus-pocus "character analyst," and pseudo-psychoanalyzer. Continuing the work of Karl Pearson, Hollingworth, Poffenberger, Cleeton, Knight, Charters, Kenagy and others, Paterson shows the folly of these shortcuts to a knowledge of human nature. We find that red hair does not indicate a fiery temper and that fat, lean, rounded-headed, long-headed, blue-eyed, brown-eyed, blonds and brunets make equally good salesmen, mechanics, and executives. There might be individual esthetic preferences among some gentlemen for blonde or brunette stenographers, but this is a personal matter. All this work shows that deep perpendicular lines between the eyes may indicate concentration of thought and may indicate stomach ache; intense, close-set lips may indicate executive capacity or kidney trouble. A big strong chin may be a "fighting chin;" however, the biologist, at least, believes this may indicate that a big, strong-boned man may have married a tiny, small-boned woman, and that possibly the child has inherited a jaw bone from his father and most of his skull bones from his mother. Thus, a man may have the jaw-bone of an ass and the skull of a genius—or, we regret

to say, the reverse might be true. At best this is a good a guess as that of our character analyzers, since all work to date strongly indicates that intelligence is seated in the neural constitution and not in the bones, muscles, viscera, or even, as so often maintained, in what Barker has aptly termed the "incrertory" glands. In any case the exterior of a man tells us precious little as to his interior mental and temperamental constitution.

Notwithstanding all this, however, some business men still continue to consult the stars instead of the psychologists and study the signs of the Zodiac instead of the signs of ability. Nevertheless popular education is making definite headway against the magic venders, bunk-shooters and star-gazers generally.

In conclusion, it seems to me the greatest concept that has emerged is that a true science of society must be built upon a true science of the individual. Man is not a bundle of grandiose generalized principles such as Rousseau and Mill and Herbert Spencer, and later, Graham Wallas and even McDougall have pictured him, but is an individualized set of highly specialized mechanisms; and only when we know what these mechanisms are, and can measure them quantitatively and provide for their satisfactions will we be in a position to draw social economic or political generalizations that will give us valid foundations for a science of society.

Yet I venture to believe that in the

end the science of psychology and the sciences of economics and politics have the same great objective in view; and, while it may seem a counsel of perfection, I think what we all look for and are working for is a society where the highest man and the humblest man shall each participate to the limit of his trained hereditary capacities in the treasures of our common life—our treasures of wealth and leisure, of art and knowledge, of mental and physical adventure; a society where every man will be adjusted to his work, first by mental and temperamental measurements; second by vocational education and guidance; third, by cultural background and historical perspective; fourth, by wage systems and wealth distribution; fifth, by political procedures; and sixth by social, ethical and religious idealisms, so that every man shall do the work he loves to do and shall find in his work the development of his character and the consecration of his powers; a society where a man's work and the broad human relationships that surround it shall help him to think and feel his way into social processes of his time; a society where the procedures that select a man for his work, that train him in his work, that surround him while he works and that give him the objectives for which he works shall all combine to make him a happy and an effective partner in a truly progressive social evolution.

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The Worker's Mind Today

BY WHITING WILLIAMS, *Cleveland, Ohio*

That the American worker possesses more mobility and resourcefulness, more lightness on his mental and economic toes; that his leaders and employers are now much more intelligent and socialized than ever before; and that therefore America should endeavor through longer planning of new products and new markets, not simply to palliate unemployment, but also to prevent it—these are the conclusions reached by Whiting Williams, industrial writer and consultant, in the following article which gives the gist of his address at the annual dinner of the Personnel Research Federation. It is impossible adequately to reproduce in print the speaker's vivid narrative of workers' experiences and attitudes, which he observed while mingling with the unemployed, as one of them.¹

WHY should they come lookin' fer work?" one of my fellow job-seekers answered my query outside the gates of a big Cleveland factory where I had expected to find hundreds instead of a handful of applicants. "All the regulars here know that as soon as work opens up they'll be sent for."

"It's only us floaters," he went on, "that's worried about grabbin' a job, just fer the day."

His explanation was repeated later at many plant gates in Cleveland and also in such other cities as Pittsburgh, Homestead, Detroit, South Bend, Gary and Chicago, in addition to Montreal and Toronto, all of which I visited last July and August in order to learn

the unemployed worker's state of mind.

That explanation brought the first of a whole series of agreeable surprises in the field of industrial relations as compared with what I experienced as a worker back in 1919. At that time, for instance—the depression of '21 was just beginning—it was a small plant indeed which did not show, especially on Monday morning, its scores and hundreds waiting to make sure that no stranger took away their place on the payroll.

This summer, as well as then, it is perhaps well here to explain, it proved surprisingly easy to be accepted as one of the waiting crowd—at least in the physical sense. Mentally, it was sometimes hard to remember just who I was at the moment; for instance, to keep from saying, "Hello, Jim," to a good friend and well known member of

¹ Several paragraphs of this paper are reproduced from an article entitled "Days Among Cleveland's Jobless," published in *The Cleveland* for October, 1930.

the Chamber of Commerce who almost brushed my knees as I sat on the low railing in our Public Square trying to learn the response of my companions to the smooth-tongued Communist orator.

Decidedly embarrassing would the result have been if I had failed to "come to" just when I did one early morning in Detroit. There, while the "law" (hobo for policeman), his ugly blackjack in hand, was ordering a couple of near down-and-outs to stop their fighting and move on, I stood close to him smiling my approval, as though to tell him how we minions of respectability ought to stand together against such roughneck troublemakers. Luckily, an instant later, I was able to move and move fast as he suddenly looked me in the eye and shouted:

"And that goes for ALL you bums! BEAT IT—before I break your G—d— necks!"

It took several furtive looks behind to give certainty that the blackjack was not following the bunch of us up the alley.

So it was not from the employers or their agents but from the workers themselves that testimony came for making plain these agreeable surprises. High upon the list was this one: as compared with my worker experiences in this country during 1919, I found my workless worker friends of last summer enjoying a greater vested interest—a sense of ownership in a piece of property called their job. Even though this property was not producing greater dividends than the earnings of more than a day or two of work per week, it nevertheless helped hugely to a man's standing with both himself

and his grocer, as compared with no place whatever on anybody's payroll.

To a degree unknown in any previous depression, all existing work has been divided up among the workers share and share alike. As never even dreamed of before, also, the largest and most typical employers have refrained from cutting wage rates. In Cleveland, for example, the same group of industrialists whose starting wage rate fell during the depression of 1921 from 48 cents to 36 cents per hour, held their starting rate during this depression to a net change from 44.4 to 44.0 cents per hour.

"They cut down hours," it was explained outside one well known Cleveland establishment, "but they ain't laid off a man—not in a year!"

More than ever before has it been possible for the jobseekers to get such counsel as I received outside a certain great steel plant.

"Ye've got no chance here," explained one of the regulars who lived near the gate where I was loitering, "W'y, in there they've even gone so far as to transfer their regular furnace men on to the odd jobs o' buildin' the new extension, 'stead o' layin' 'em off, see?"

Beyond question, these new practices of job-sharing, transfer and job protection represented closer and more understanding contact between employer and employee than has existed in any similar depression in history. To be sure, none of these improvements increases the total of wages actually paid to the working force as a whole. But, as compared with the older, more hard-boiled methods, they certainly do produce a huge better-

ment in *feeling*. They serve to make a man's job into something like a piece of property. Even if for a season this property pays little, nevertheless it helps a lot if its owner knows it's there, waiting its chance to come back to normal earning. Infinitely better than no job at all is the feel of a job which gives every week a couple or more days of work.

The repeated assurance from the employment office that no stranger could get their places away from them and that a man was wasting shoe leather even to come to the office pending the arrival of the promised message—this is what kept literally thousands of workers away from those dreary and demoralizing hours of plant-gate loafing and substituted instead those immensely less discouraging days of fishing or perhaps of bathing with one's family at one of the park beaches.

To these cushionings is to be added the fact that the American family enjoys today a wider dollars-and-cents base line than ever before. If Father or John has no job the chance is greater than in any previous depression that either Mother or Mary is bringing home a pay check.

In addition it is certain that partly as a result of all these improvements, the American worker entered into this depression as himself more of a capitalist than before. If he did not own his house or a savings account, or even a few shares of stock in his own or some other company, then at least the chance was good that he enjoyed the self-respect which came from his ability to hold on to the family car.

"Nothin' but a stray day's work or

two in weeks," explained one husky young fellow as we sat on the curb outside a great factory. "Not a cent for even the makin's of a little home brew." Followed a moment later by his:

"Well, I can't see no job around here so I guess I might as well *run the old flivver down town!*"

Still further any fair observer taking the trouble to get close to the worker must report that an additional cushioning for helping him weather the current joblessness has been given him by the present freedom of our street corners from saloons. As a substitute for that ancient, if not especially honorable, institution, so my experiences this summer taught me, the modern speak-easy is a total flop. In neither money nor alcohol is one of the old saloons equalled by as many as 30 or 40 speak-easies. The chief reason is that these lack almost entirely the saloon's former lure.

It is my belief that, thanks largely to the attention given these past fifteen years to industrial relations, the country's *psychology* last summer was better than the *arithmetic* of its actual unworked man-hours. This impression is made all the surer by my observation that in Canada, where employers and workers remain considerably farther apart, the country's feeling was *worse* than the situation's actual arithmetic of unemployment.

Along with these improvements in the situation of the worker, this depression has also demonstrated a more socialized employer. As never before the country's most typical employers are today feeling a deep and active sense of responsibility for both the

maximum security and also the maximum opportunity for their employees. Best of all, also, this feeling has come not as a paternalistic worry about the weak on the part of the strong, but rather as a recognition by wise men of the dependence of each upon the other. This feeling is sure to grow as rapidly as modern mass production demonstrates further to the mass producer that he is, sooner or later, simply out of luck unless supported by prosperous mass buyers.

It is nothing less than a huge tribute to all those developments I have mentioned that most of our Communist visitors appear to make slight progress among even such discouraged men and, for the most part, finish their days of exhortation and depart in disgust.

"Here I've handed out to you guys," complained one thin-chested but wiry and agile-minded pleader for the Russian plan, "a lot of books and pamphlets worth every cent of twelve good dollars. The law won't let me pass the hat, but I certainly got a fine idea of the gumption of you Clevelanders. With that hat down at my feet for one good hour, you send me away with—let's see—thirty-five, forty-five, *fifty-five cents!*"

Now with these improvements in our industrial set-up as demonstrated by our present crisis, the country has a greater right than ever, surely, to look to the industrialist for wise leadership in handling both the emergency and the more permanent situation.

The elimination, or at least the strict control of the private employment bureau and the substitution of public exchanges; the training of workers into several different kinds of skills;

the adding of factory products calculated to stabilize year-round operations; the announcement to workers of the amount of employment they can now expect; the payment of separation allowances when lay-offs are unavoidable—all these are of the utmost importance, not only to every city's workers, but through them to the entire body of every city's business men and citizens of every type, bar none.

But further, that remarkable ingenuity and initiative of our typical American worker and that equally remarkable spirit of cooperation between him and his leaders and his employers, make it altogether of the utmost importance that, in our effort to handle either the emergency or the permanent problem, we should not by any chance whatever utilize those methods which represent an admission of defeat. Instead of more relief doles, every conceivable effort must be made by the government, by industry and by the domestic householder to give work. If we are to embark upon a program of insurance against unemployment, we should make sure that all its emphasis is upon not mere palliation but prevention. That country is skidding toward demoralization whose public begins to imagine that a man receiving \$15.00 a week without work is anything like half as well off as a man earning \$30.00 at his lathe or bench. In all the world there is no substitute for a job except another job. Men pray to receive not the daily bread but the daily job because this job feeds not only the body but also a man's self-respect.

As Americans, we have developed for our entire population the highest

standard of living known in the world. We must not consider back-tracking to those lower levels which are sure to follow upon any lessened use of the machine or upon any permanent policy of part time work and a part time paycheck. On the contrary, we must plan better to coordinate our resources of individual initiative, freedom, intelligence, and responsibility in order to find ways to promote such still higher standards of living here and abroad as will consume the products of our workers in charge of increasingly productive machines.

Such coordination will mean immensely more teamwork than we know now—teamwork within a given community, such as Philadelphia, for instance, is now working for. Also more teamwork between the members of entire industries and then of groups representing related industries and, still further, between these related industries and government. If this is all forbidden by the Sherman Act, then we should change the Act.

Something of this type, in combination with our American individual responsibility and freedom, is sure to help every industrialist to do his planning on, say, a three year basis, making sure that with the help of longer planning, his products and his methods keep constant step with the changing needs and demands of his customers. Such longer planning will go far toward supplying the needed jobs by means of the invention of products now undreamed of—products the making of which will employ the men laid off through the improvement of processes and methods. It is all wrong from the viewpoint of our longer future that

today hardly five per cent of the scores of millions expended annually in our thousand and more industrial research laboratories, is devoted to the discovery and invention of new products. The chief reason is, according to our best research experts, that we are today too budget-minded—willing to take a chance on the inventor's studies, provided only that he will guarantee to bring in a new product before the end of the current fiscal year!

If we are to look wisely at the present situation we must face the fact that the ability to consume goods is infinite on the part of both America's and the world's workers. It is more helpful to consider the problem as a problem in under-consumption than in over-production, especially when we consider that we here in America earn a national income of around ninety billions yearly, which is roughly equivalent to the yearly income of the earth's remaining billion and a half of people. To these others we shall never be able to sell as much as we should till we grow more internationally minded.

Such increased coordination within and between our industries, combined with such three or five-year budgeting and the resultant product research, and increased international-mindedness, would only represent our growing recognition that all our political, all our social and all our economic institutions are in danger unless we can somehow contrive to give a better answer to that prayer of our fellow citizens—'give us this day our daily job.'

Unlike Italy or Russia, where such coordination and such longer planning have gone farthest, our American

emphasis would be to make sure that the increased security of our workers should by no means come to lessen their maximum conceivable opportunity. Only in so far as our workers are helped not simply to stand safely

still, but rather to grow and expand in material and social well-being, can we look forward to a continuously successful America; and such courageous efforts here can not fail to be of value to the other peoples of the world.

News Notes

ACTIVITIES OF MEMBER ORGANIZATIONS

Industrial Relations Section of Princeton University

The Industrial Relations Section of Princeton University has recently prepared two useful memoranda. *Company Plans for the Regularization of Plant Operation and Employment* first points out that private plans for preventing the evils of industrial instability can be divided into two main groups: plans for the regularization of plant operation and employment, and plans for the indemnification of employees for whom no work is available. It is emphasized that the first group hits closer to the heart of the problem in seeking prevention rather than partial offset. Then brief summaries are given of the regularization programs under way in the Procter and Gamble Company, Dennison Manufacturing Company, General Electric Company, Delaware and Hudson Company, Walworth Company, and Southern Pacific Company.

The second report deals with *Employee Rating Scales*. After pointing out the uses, value, and limitations of rating scales, it gives examples of various types of scales, together with discussions of their individual merits and disadvantages for industrial use.

These two reports may be secured without charge by addressing the Industrial Relations Section of Princeton University, Princeton, New Jersey.

Western Electric Company's Studies *Translated*

The Western Electric Company's significant research investigations of rest pauses, working conditions and other influences such as character of supervision, reported in the February 1930 *PERSONNEL JOURNAL*, are receiving ever wider attention. The International Management Institute with headquarters in Geneva is to publish the reports

in French and German, while the investigations are described by Elton Mayo in the January number of the *Journal of the National Institute of Industrial Psychology* in Great Britain.

Women's Bureau of the U. S. Department of Labor

Bulletin No. 81, *Industrial Accidents to Men and Women*, published by the Women's Bureau of the U. S. Department of Labor, contains an analysis of State accident reports that show data by sex from 1920 to 1927. It presents important facts about the number and character of accidents to women, and, in addition, shows that the State reports that give industrial accidents to men and to women separately are, except in very few cases, insufficient and unstandardized.

Analysis of data in the Women's Bureau study, however, revealed certain significant facts. Accidents to women were actually and relatively fewer than those to men. Women constituted a smaller proportion of the total number injured than of the total number gainfully occupied. Nevertheless, the numbers of women injured were large. For example, in New York State as many as 7,000 women were compensated for industrial accidents in one year.

In regard to the results of the accidents, the injured women had relatively fewer fatalities than had the men. The two sexes had about the same proportion of permanent total disabilities.

Attention is drawn to the importance of machine hazards in their toll of young workers. The large number of accidents to minors, particularly machine accidents, indicates that insufficient protection to young workers is given by present standards. As long as youth is careless and venturesome accidents will occur unless safeguarding is more complete than seems necessary or possible in the case of adults. The prohibition of em-

ployment of young persons in dangerous occupations is suggested as an important way of meeting this problem. The larger part of prohibitions under the present laws apply only to boys and girls under 16. Restrictions for those of 16, 17, and 18 are comparatively fewer, and minors of such age are employed on punch presses and machines which are known to cause many accidents, with no more restrictions than are made for the safety of workers in general. A considerable proportion of accidents to women are to those under 21, a much larger percentage of the women than of the men in this age group being injured.

University of Pennsylvania

The Industrial Research Department of the Wharton School of Finance and Commerce has published a study entitled *Wages: A Means of Testing Their Adequacy*, by C. Canby Balderston. The purpose of the study was to discover methods for testing the adequacy of an employee's wages to maintain a typical worker and his family.

February Meetings in Detroit

The joint meetings of the National Vocational Guidance Association, National Education Association, National Association of Placement and Personnel Officers, Personnel Research Federation, and other organizations interested in educational and vocational guidance, placement, and personnel problems, will take place at Detroit, February 19 to 26, 1931.

The general theme of the National Vocational Guidance Association meetings, to extend from February 19 to 21, is "The Community at Work for the Vocational Guidance of Youths and Adults." General sessions will be devoted to Vocational Guidance in Industry and Commerce, Integration of Vocational Guidance for the Individual in the Public Schools, Coordination Between Schools and Community, and other subjects.

The National Education Association program will also include meetings on vocational guidance on the morning and afternoon of February 24.

Of special interest may be the joint meeting on Saturday morning, February 21,

of college personnel workers. With Helen D. Bragdon as Chairman, the following papers will be presented: Determination of College Fitness As an Element in Vocational Guidance, by J. B. Johnston; Survey of Graduates of Wisconsin High Schools As an Aid in College Guidance, by F. D. Holt; A Five-Year Study of the Occupational Distribution of the Class of 1922, by Mary A. McCurley; and The Dean As a Vocational Adviser, by Iva F. Peters.

CORRECTION

Dr. Sadie Myers Shellow wishes to make a correction. In her article on the *Accident Clinic*, published in the *PERSONNEL JOURNAL* October, 1930, vol. IX, no. 3, in Table 7, on page 215, the number of accidents per each trainman should have been carried to more decimal places. The number from January 1 to June 30, 1929 should read .765 instead of .8, and the number from July 1 to December 31, 1929 should read .647 instead of .6. This makes the reduction in accidents a little over 15 per cent in place of the 25 per cent as stated.

INDUSTRIAL PSYCHOLOGY LITERATURE REVIEWED

Psychology in Industry, a sixty-eight page critical review of the literature since 1927 by Morris S. Viteles, makes up the October 1930 number of The Psychological Bulletin. This thorough and keen review of 480 books and articles is invaluable for reference. In order to give as wide a circulation as possible, the Federation has issued it as No. 22 of the Reprint and Circular Series. Price fifty cents.

NATIONAL INSTITUTE OF INDUSTRIAL PSYCHOLOGY

The title of Charles S. Myers, founder of the National Institute of Industrial Psychology of London, has been changed from that of Director to Principal. George H. Miles, formerly Assistant Director, is now Director.

OPPORTUNITIES FOR WOMEN IN PERSONNEL WORK

The Altrusa Club of Boston has drawn together the opinions of its members (women)

engaged in various occupations concerning the present state of affairs in their own occupations. While these are opinions of small groups, we quote the resultant statements about work in the personnel field.

Personnel Manager in Department Store. The outlook is only generally fair, for the period of expansion in personnel departments seems to be at an end. There is a general tendency to curtail them. The supply of candidates in Boston usually exceeds the demand. The field is more difficult to enter as it is constantly becoming more crowded, requirements for preparation are more demanding, competition is keener, and there are fewer jobs opening up. It is more difficult to achieve success, as personnel work has passed the stage where store owners were willing to experiment and await results; it is constantly under most rigid scrutiny and must show an ever higher record of production in order to maintain itself. The standards of what constitutes success are much higher, and the tendency toward mergers has probably decreased the number of worthwhile jobs in the field.

College Appointment Bureau. There is a very good chance all over the country for college personnel work. Many colleges have opened new departments and others are likely to do so. As there are very few really trained people, it is comparatively easy for anyone with the right personality who has had training, and who is geographically free, to get started. One has to keep up with modern methods and ideas to be successful, and it is becoming more and more necessary to have a Master's degree. The field has broadened on account of the general development of college personnel work, owing to increased enrollment and the need for proper selection and individual study of the student.

Industrial Relations, Factory. The outlook is not good. Because of present industrial conditions there is a tendency to cut down overhead as much as possible. But since women in industrial supervisory jobs are taken more for granted, it is easier to achieve success. The present slump is temporary.

Lecturer on Personnel in Education, Vo-

cational Guidance. This field is limited by the number of educational institutions, and is more difficult to enter than in the past because it requires more preparation and more attention to research. For the same reason it is harder to achieve success. The field is becoming subdivided. Psychology is very important. It is still necessary for the head of a department to have wide knowledge.

Personnel Director, Industry. Owing to the present industrial conditions, the outlook is not favorable. This is still considered pioneer work for women, so it is not easy to enter the field. But it is easier to achieve success, as open-minded managements are interested in women executives. The increasing number of women in industry broadens the opportunity.

UNIVERSITY OF KENTUCKY

A new development at the University of Kentucky this year has been the establishment of a Personnel Bureau, to serve students and guide them in their vocational adjustments. Dr. Henry Beaumont is executive secretary of the bureau and Dr. J. B. Miner, head of the department of Psychology, is director.

The bureau assists students who are having difficulty with their college work by pointing out the weak spots in their study methods and suggesting improvements along the lines of efficient study. The bureau is collecting information concerning various occupations open to college-trained people, and is making contacts within and without the state; it also refers students to the departments best prepared to advise them as to the preparation they should make for the type of work they are contemplating.

The Personnel Bureau will not undertake any responsibilities of the various deans and faculty members, but works with the idea of supplementing their service and cooperating with them in their personal contacts with the students.

SOCIAL WORK YEAR BOOK

The article on *Personnel Administration in Industry*, by William M. Leiserson, in the

Social Work Year Book recently published by the Russell Sage Foundation, is a crisp, clear-cut picture of the field.

After defining personnel administration in terms of three classes of functions: employment management, service management or welfare work, and joint management or collective bargaining, the author traces the history of the movement. The germ is found in Robert Owen's early welfare work, and development is traced down to the present day. The various influences affecting the development of personnel administration in industry are pointed out, and its present status is described.

INTERNATIONAL CONFERENCE OF INDUSTRIAL PSYCHOLOGY

The Seventh International Conference of Industrial Psychology (Technopsychology, *Psychotechnique*), will be held in 1931 in Moscow, under the presidency of Dr. I. Spielrein of the Institute for the Protection of Labor. While the date has not been definitely determined, it will probably begin on September 15. Industrial psychologists who wish further information regarding this international conference may correspond with American members of the Council, W. V. Bingham, 29 West 39th Street, New York; and M. S. Viteles, University of Pennsylvania, Philadelphia.

PERSONNEL CONFERENCE

What's Ahead in Personnel Administration will be the topic of the second conference of the Personnel Division, American Management Association, 20 Vesey Street, New York. The conference will take place at Niagara Falls, New York, during the first week of February, 1931.

Among the subjects to be discussed are: Trends and Changing Emphasis in Personnel Practice in the Last Decade; What Has Happened to Personnel Practice in 1930; Management's Obligations to Its Employ-

ees; and, The Public Relations Aspect of Personnel Relations.

INTERNATIONAL INDUSTRIAL RELATIONS ASSOCIATION

International Industrial Relations Association (I. R. I.), with headquarters at The Hague, Holland, has decided to make its second triennial Congress the occasion for a conference on the subject of *The need for Scientific Adjustment of Economic Resources, Production, and Consumption as Essential to Satisfactory Human Relations and Conditions in Industry*.

In announcing the subject this Association points out that there is an ever growing realization of the fact that industrial relations are profoundly disturbed because neither labor nor capital can fully function in a world of unadjusted resources, production and consumption. Unemployment today is widespread through the world. Markets are restricted by lack of purchasing power. Productive capacity has been enhanced at an increasingly rapid rate by mechanization and the advance of technological invention. Yet in a world of enlarged economic resources, groups in industry, whether conceived as employer-employee, labor-capital, producers-consumers, are prevented from functioning normally, that is, human relations in industry are not satisfactory.

The Congress will be open not only to members but likewise to all who, either from study or experience, have a contribution to make.

It is anticipated that the actual dates of the Congress will fall within the last week of August. The program containing all particulars will be published in the near future. Persons desiring to receive a copy are invited to communicate with the Secretariat of the I. R. I.: Javastraat 66, The Hague, Holland, or to office of Vice-President of I. R. I., Room 600, 130 East 22 Street, New York City.

Personnel Books

EDITED BY DOUGLAS FRYER

This issue of BOOKS emphasizes the value of psychological and economic research in industry. The leading review by E. S. Cowdrick shows that management's problem in the textile industries is one with purely an economic solution. An array of psychological problems of industrial moment is reported as completed, or in progress, during this last year by the Industrial Health Research Board. A recent book by Otto Lipmann, who visited several American industries about a year ago, is reviewed at length by a student of this German leader in a manner to show the attack upon psychological problems which is made in German industry. "Briefer Mention" includes a survey of collateral readings upon personnel problems. Brief factual statements of books in the scientific fields of psychology, mental hygiene, mental tests, economics, sociology and philosophy are included here along with reviews of books of lesser interest in such fields as vocational guidance, industrial education, management and administration. These reviews are prepared by a staff of specialists working in the interests of the development of personnel activities. "New Books" includes announcements of publications during the months of October and November.

COLD STEEL ON THE TEXTILE FRONT

MANAGEMENT PROBLEMS. With Special Reference to the Cotton Textile Industry.
Edited by G. T. Schwenning. Chapel Hill: Univ. of North Carolina Press,
1930, xiv + 266 pp., \$2.00.

Reviewed by EDWARD S. COWDRICK, *Industrial Engineer, N. Y. C.*

Professor Schwenning has brought together in one volume a number of lectures, all but one of which were delivered before the University of North Carolina student branch of the Taylor Society. H. S. Person, managing director of the Taylor Society, has contributed an introduction. The lectures are grouped in three divisions: textile problems, personnel problems and selected problems—the last group covering as diverse subjects as calendar reform and advertising campaigns for the sale of fountain pens and portable typewriters. An appendix gives detailed information regard-

ing the organization and administration of the Kendall Company, supplementary to a lecture by Henry P. Kendall on the topic "How One Management has met Problems of the Textile Industry."

Incidentally, Mr. Kendall does not picture the future of textiles in rosy colors. Here are the concluding paragraphs of his lecture:

"I am sorry, but I have no remedy to offer. If I did, it would already have been applied. Mergers will not help. Unions will not help. Surveys will not help. Legislation will not help. The thing will

have to work itself out like an epidemic of influenza or the aftermath of a stock market debacle or a tidal wave. Either production will have to come down to consumption or consumption catch up with production.

"Some of the less efficient mills will have to go under and the remainder put upon some sort of efficiency basis. There will have to be even greater curtailment in the future than in the past. This means further unemployment, and I should think that the thoughtful citizen would see that these are no times to try and force the issues of higher wages or lower hours upon an already overburdened industry."

To the reader not directly concerned with textiles, probably the most interesting section of the book is that classed as personnel problems and comprising two lectures, one on "Management and Technological Unemployment" by Professor Harry D. Wolf, and one on "The Management of Manpower" by Professor G. T. Schwenning.

Dr. Schwenning outlines the development of personnel administration, which he defines as "the application of science in the effort to utilize as effectively as possible one of the major economics factors in the production of wealth, namely, manpower," and which he traces from the earlier sociological experiments of Robert Owen. He

gives much credit to Frederick W. Taylor, whose formulation of the principles of scientific management, he says, marks a "milestone in the long history of personnel management."

Much of Dr. Schwenning's paper is devoted to the relations between scientific personnel administration and the union labor movement. He criticizes the efforts made by some labor leaders to block the development of harmonious relations between employers and employees. "The notion seems to be that we must have the trade union to fight bad labor conditions, and that management must maintain bad conditions to give the grade union an opportunity to fight." He gives credit to the labor union movement for important accomplishments but he concludes:

"Finally, unless we are uncompromisingly committed to the belief that trade unionism is the only vehicle of labor progress, or unless we hold the left-wing socialist doctrine that capitalism is untenable and must be overthrown by labor, we must concede that the labor policies and practices of American industry have during the past decade contributed materially to the solution of our labor problems and to the economic and social progress of the country."

THE TENTH YEAR OF INDUSTRIAL RESEARCH IN GREAT BRITAIN

TENTH ANNUAL REPORT OF THE INDUSTRIAL HEALTH RESEARCH BOARD TO DECEMBER 31, 1929. London, His Majesty's Stationery Office, 29 pp. (6 d.)

(Reports listed below were published during 1929 and are obtainable at H. M. S. O., London.)

A STUDY OF PERSONAL QUALITIES IN ACCIDENT PRONENESS AND PROFICIENCY. By Eric Farmer and E. G. Chambers. Report No. 55. 84 pp. (3 s. 0 d.)

THE EFFECTS OF MONOTONY IN WORK. By S. Wyatt, J. A. Fraser and F. G. L. Stock. Report No. 56. 53 pp. (2 s. 0 d.)

FURTHER EXPERIMENTS ON THE USE OF SPECIAL SPECTACLES IN VERY FINE PROCESSES. By H. C. Weston and S. Adams. Report No. 57. (1 s. 3 d.)

Reviewed by LELAND W. CRAFTS, *New York University.*

The following is a review of the three researches published by the Industrial Health Research Board during the year

1929, together with a brief description of investigations now in progress.

Accident causation. A second report on

the psychological factors involved in accident proneness has been published. Previous investigation had already shown that individuals who gave a superior performance in certain sensory-motor tests had an accident rate lower than average. The same tests have now been applied to 1,800 subjects, mainly Royal Air Force and Royal Dockyard apprentices, and the original conclusions for the most part substantiated. In groups of apprentices with suitable accident records, for example, those who failed in the tests had an accident rate 2½ times greater than those who were successful. The investigation is now being extended through the examination of further groups of engineering workers with these and other tests.

Relief of eye strain in very fine processes. A further series of experiments on the use of special spectacles in very fine processes—steel ball examining, cloth mending, linking and embroidering hosiery, and fish hook filing—has been completed. The results show that the benefit derived from these spectacles is not confined to individuals having visual defects but extends also to those of normal vision. Twenty-eight persons, thirteen of whom had normal vision, were supplied with glasses designed to reduce the efforts of accommodation and convergence in their work and, for those with eye defects, to correct errors of refraction also. The efficiency of all the subjects with abnormal eyesight, and of a majority of those with normal eyesight, was substantially increased, although the improvement was of course greater in the former group. The authors add that the workers themselves think that they are materially benefited by the glasses, and point out that the cost of the latter can be recovered by the increased output within a few months at the most.

The effects of monotony in work. An investigation into the "incidence and symptoms of boredom" in repetitive work has also been published. The occupations studied were inserting and filament winding in the manufacture of metal lamps, soap wrapping, chocolate packing and tobacco weighing. The data were output curves obtained from close personal observation of 49 work-

ers over periods of several days, together with the subjective impressions of the operatives themselves and their intelligence test scores. The principal results were as follows: Boredom is fairly prevalent in such repetitive work, and causes a reduced and a more variable rate of working. The amount of boredom depends on three types of factors: (1) The characteristics of the individual worker. Temperamental tendencies are important; and intelligence is also, since those of superior intelligence are more apt to be bored by such work. (2) The degree of mechanization of the task. Boredom tends to be less when the work is entirely automatic, provided the worker can find distraction in thought or conversation, and when it requires complete concentration, "It is most marked in semi-automatic processes which require enough attention to prevent mind-wandering but not enough for the complete absorption of mental activity." (3) The conditions of work. The amount of boredom can be lessened by changing the form of activity at suitable times, by introducing suitable rests within the spell of work, by paying the operatives according to output instead of time, by allowing them to work in social groups instead of alone, and by making it possible for them to conceive their work "as a series of self-contained tasks rather than as indefinite and apparently interminable activity." The last named condition can be achieved by an hourly instead of, say, a daily distribution of supplies; with the former method the immediate task seems less "endless and overwhelming and a feeling of achievement is more easily attained."

The annual report calls attention as usual to many important researches planned, in progress, or completed but as yet unpublished. Among these are studies of the effect on working efficiency of various modes of heating, ventilation and illumination, and of noise and vibration; investigations into the causes of accidents, labor turnover, absenteeism and sickness in various industries; studies on the physique of men in industry, of the occupational fitness of mental defectives, of the effect of pit-head baths on miners, and of repetitive work in general

with special reference to the relation between temperamental differences and efficiency therein; data as to the incidence of neuroses among the working population. The attempt to develop tests of use in vocational selection is being pursued as before. Laboratory researches mentioned deal with concentrated versus distributed practice, the characteristics of learning curves and the causes of plateaus therein, the effect of variety versus uniformity of work, and the effect of various incentives both on initial

acquisition of skill and on later fluctuations in efficiency.

The Board point out that although many of their investigations are naturally still in an experimental stage, other have yielded definite conclusions which have already been adopted to good effect in certain industries. They express themselves as being now anxious to arouse a still wider interest in their work and in its numerous practical applications among employers and trade unions.

THE PERSONALITIES IN PSYCHOLOGY

THE DEVELOPMENT OF A HISTORY

A HISTORY OF EXPERIMENTAL PSYCHOLOGY. By Edwin G. Boring. New York: Century, 1929, xvi + 699 pp.

PSYCHOLOGIES OF 1930. By 24 Psychologists (Edited by Carl Murchison). Worcester: Clark Univ. Press, 1930, xix + 497 pp., \$6.00.

GREAT EXPERIMENTS IN PSYCHOLOGY. By Henry E. Garrett. New York: Century, 1930, xvii + 337 pp.

A HISTORY OF PSYCHOLOGY IN AUTOBIOGRAPHY. Vol. I. By 15 Psychologists (Edited by Carl Murchison). Worcester: Clark Univ. Press, 1930, xvii + 516 pp., \$5.00.

Reviewed by DOUGLAS FRYER, New York University

A science is the sum-total of the facts within its boundaries. To portray the historical sequence of knowledge is a most difficult thing. Only in the more exact sciences can this be done with clear insight. In the younger science of psychology the sequence of factual knowledge is often obscure. Personalities stand out as focal points around which experimentation progressed and systems developed. THE PSYCHOLOGIES OF 1930 is a record of systems, following the similar THE PSYCHOLOGIES OF 1925. Here, the more popular schools of behaviorism and *Gestalt* psychology are, of course, represented, but there is greater emphasis in the recent book upon the theories which are considered fundamental in any field of experimentation.

Boring's HISTORY OF EXPERIMENTAL PSYCHOLOGY includes more scientific facts than any similar book published. Yet it portrays the development of the science through its great personalities. The history of psychology is traced over a half a

century from 1860 to 1910 beginning with Fechner's ELEMENTS of 1860 and Wundt's BEITRÄGE of 1862. The roots of psychology are in physiology and philosophy. During the first half of the 19th century Bell's law of the polarity of the stimulation of the spinal cord came into existence. Johannes Müller contributed to the knowledge of reflex action and sensory physiology. Helmholtz measured the velocity of the nerve impulse (1850). Flourens cleared up our knowledge of the brain where Gall and Spurzheim had led us astray in phrenology. Psycho-physics came into existence with Weber and others. In this way early 19th century physiology laid the foundation for experimental psychology.

Before the middle of the 19th century psychology was thought of as a part of philosophy. With Descartes (1596-1650) there is seen the beginnings of modern philosophical psychology, although the influence of Aristotle and Greek thought is traceable throughout modern psychology.

Psychology is said to have begun in Germany with Leibnitz, but his influence upon experimental psychology is seen by Boring as less than that of Descartes, who contributed the mechanistic approach and the theory of the location of the mind in the entire body with specific localization within the brain, also less than that of John Locke (1632-1704) who contributed many of the concepts of the association school. Among the later associationists appear such names as Berkeley and James Mill, early in the 19th century. Herbart was the Mills of Germany and his contribution of the theory of apperception causes him to be regarded today as the father of scientific pedagogy. These were the leaders in a philosophical preparation for a scientific psychology.

The founding of an Experimental Psychology is just after the turn of the half century with Fechner and Wundt as the outstanding personalities around whom experimentation is grouped. Then there was von Helmholtz, physicist and physiologist, who must be grouped with the other founders of experimental psychology. Wilhelm Wundt (1832-1920) is regarded by Boring as the first experimental psychologist in the real sense of the word, who founded the first laboratory in 1879 and worked entirely from the point of view of this new science.

After Wundt and Fechner the history of psychology is a passing array of scientific personalities. Henry E. Garrett in his *GREAT EXPERIMENTS IN PSYCHOLOGY* shows that the great experiments have been dominated by the minds of the leaders. Among these leaders are Galton, who pioneered in the study of individual differences, Ebbinghaus, who studied memory and forgetting, Cannon who studied the physiology of the emotions, Alfred Binet who experimented upon the measurement of general intelligence, Thorndike who studied the methods of learning, and so on. Garrett has given us an interesting picture of the experimental work surrounding the prominent figures in psychology. This is history from the definite point of view of what has been done in the major fields of experimentation and it is prepared for elementary classroom use.

The march of personalities in Boring's *HISTORY* is systematic and full of interest. Stumpf, a student of tone, and Kulpé who contributed to the field of memory, represent the German Wundtian psychology. Titchener brought the Wundtian psychology to America, and never became a part of American psychology. Americans went to Germany to study, but came back students of individual differences and followers of Galton. Wundt was the father of psychology, but Galton was its guiding genius in America. Modern experimental psychology was late in making a beginning in Great Britain (1910). Except in Pearson's work upon statistical concepts, there seems to have been no great development in Great Britain of capacity psychology. This development came in America. Among the British leaders of Experimental Psychology are listed Charles Myers, William McDougall and C. Spearman, all living. The American pioneers are much earlier: William James, G. Stanley Hall and G. T. Ladd upon whom the influence of evolution was very great. There are many other psychologists whose contributions are reviewed in these volumes. Many of them are living and are the leaders in psychology today.

Personalities have always dominated the historical situation in Psychology. Boring mentions that what Wundt said was nearly always important, quite independently of the weight of experimental evidence. Personalities are reflected in schools as shown in the *PSYCHOLOGIES* of 1930 and these theories form the foundation of experimental research. A *HISTORY OF PSYCHOLOGY IN AUTOBIOGRAPHY* is, it would seem, the final answer to this growing desire to understand the personalities of the Science of Psychology. It is the first volume in a series, of which three will be published this year, and in which the leaders in psychology today will contribute the history of their own experimental contributions. These volumes are a publishing venture projected by Carl Murchison of Clark University with the commendable aim to preserve the history of psychology in the words of the psychologists who are making it. Five psychologists, one from Europe, formed a committee to "assume responsibility for all

invitations extended for inclusion" in the series. The Autobiographies will not necessarily appear in the order of eminence or seniority. Autobiographies of the following psychologists appear in the first volume:

James Mark Baldwin of America (now in Paris)
 Mary Whiton Calkins of Wellesley College
 Edouard Claparède of the University of Geneva
 Raymond Dodge of Yale University
 Pierre Janet of the College of France
 Joseph Jastrow of the University of Wisconsin
 F. Kiesow of the Royal University of Turin
 William McDougall of Duke University
 Carl Emil Seashore of the University of Iowa

C. Spearman of the University of London
 William Stern of the University of Hamburg
 Carl Stumpf of the University of Berlin
 Howard C. Warren of Princeton University
 Theodor Ziehen of the University of Halle
 H. Zwaardemaker of the University of the Utrecht.

Without the human excitement surrounding the discovery, the facts are cold. Paul de Kruif in his *MICROBE HUNTERS* has shown the imagination involved and the excitement surrounding the discoveries of such men as Pasteur and Walter Reed. Here in these volumes are the outlines of the personalities who have made the great discoveries in psychology.

GUIDANCE IN EXECUTIVE VOCATIONS

INTRODUCTION TO BUSINESS MANAGEMENT. By Herbert G. Stockwell. New York: Harper, 1929, 276 pp., \$4.00.

Reviewed by DWIGHT FARNHAM, *Peat, Marwick, Mitchell & Co., N. Y. C.*

The object of this book, as stated on the cover, is both to assist young men in business to learn about the jobs higher up and to stimulate the desire of those possessing managing ability into organized efforts to qualify as managers. In order to attain this objective the author outlines "the important business activities, functions and offices and tells how the managers of those offices think, feel and act."

Careful perusal of the book's 276 pages indicates that Mr. Stockwell has performed a difficult task with considerable ability. It is a good piece of work both from the vocational and from the informative standpoint. This is a rather rare combination as the men who know the most about business usually fall down when they attempt a vocational exposition.

The treatment of the various subjects is unusually sound for a book of this type. It avoids most of the mistakes usually made by business men who attempt to instruct and

inspire the young. The absence of preaching and philosophizing is particularly refreshing. It also avoids the mistakes of the type of vocational expert whose intentions are good but whose real knowledge of the intricacies and motivating factors of business is so superficial as to render his explanations ridiculous to the initiated. The book abounds in common sense and accomplishes its purpose.

Furthermore, it goes deeply enough into the work and duties of the various industrial executives to not only make their problems and positions clear, but also to set forth a considerable quantity of information which should be of interest to the occupants of the various positions. The illustrations are good and the material is interestingly presented. On the whole the book might well be read by industrial executives themselves as well as by those who aspire to fit themselves for the better paid positions in industry.

OTTO LIPMANN AND INDUSTRIAL PSYCHOLOGY IN GERMANY

GRUNDRISS DER ARBEITSWISSENSCHAFT UND ERGEBNISSE DER ARBEITSWISSENSCHAFTLICHEN STATISTIK. By Otto Lipmann. Jena: Fischer, 93 pp.

Reviewed by MAX F. HAUSMANN, *Johns Hopkins Hospital*

Before the Journal Club of the Henry Phipps Psychiatric Clinic, Johns Hopkins University, Baltimore, April 16, 1930.

Otto Lipmann defines "Arbeitswissenschaft" as "The Science dealing with the relationship between various conditions of human work and their effects." The name "Science of Work," is the literal and probably the most accurate translation into English of the German movement. The "Science of Work" embraces a considerably larger field than does Industrial Psychology as this field is defined in America. Essentially in addition is the physiology of work and certain economic considerations.

"The Science of Work," Lipmann continues, is a causal science, i.e., it tries to establish a causal relation between the conditions of work on the one hand and its consequences on the other hand. The "effects" are either material ones, to be observed objectively, or psychic ones, discernable in the self observation of the worker. These last are, of course, of general scientific interest to us. But from the point of view of industrial efficiency they are of interest only in-so-far as they contribute to the material effects. They influence the "willingness-to-work," which in turn influences the "productivity-of-the-work." Dr. Lipmann's book outlines first the principles of the "Science of Work" and then deals with their realization in modern industry.

Two methods of industrial research are mentioned by Lipmann. We can start from two different conditions of work and follow-up the effects they produce. An example would be an investigation into the different consequences and concomitant phenomena of men's labor and women's labor. Or, we can start from different end-effects and trace back to causes. An example of this kind of investigation would be to establish the conditions upon which the quality of the output depends.

An extensive list of conditions, or causes, on the one hand, and consequences and effects on the other, includes the external conditions of work, such as periodicity of year, periodicity of day, distribution of work in the course of a week, pay period, hours of work, rest periods, etc.; it includes the conditions depending on the worker, such as age, sex, race, physical ability; the worker's vocational training; his occupation during off-time, his willingness to work, his use of drugs, alcohol, etc.; his economic condition; his fatigue, boredom, and moods; characteristics of the shop, such as climate and geographical situation, illumination, dust, odors, noises; the nature of the work and rest rooms; the kind and organization of the work done, such as machine work or mental work, skilled work, inspection work, team work or individual work; the tools and raw material used, the lay-out of work with the aid of time and motion studies, the control system; other psychological influences to which the worker is exposed, such as the wage system, safety-first campaign, the amount of wages earned, work councils and welfare work. All these factors, in their integration, determine the "effects" of human work, which can be expressed in terms of: (1) Effects on quantity and quality of the production, (2) effects on the shop as a whole, that is, amount of raw material used, amount of waste products, lost time (tardiness, etc.), labor turn-over, and (3) in relation to the worker himself, in cumulative fatigue (permanent deterioration), health (mortality), accidents, mental attitude, cultural level and income. We see that we are dealing with tremendously complicated conditions and that the task of the Science of Work is to disentangle the constituents of the two integrated blocks and to put them into

simple correlations. For instance, what are the effects of an increase in the daily hours of work, or, what relation exists between the wage system and productivity, or, on what causes does the accident rate depend?

All work, from a psychological standpoint, is a process of formation. It is the transformation of a given structure into another higher structure. In the highest form of work only the ultimate goal of the work is prescribed. In the middle and lower forms the means by which this goal is to be attained are also prescribed. A psychological analysis of work is concerned with the means or procedures, once the starting point and the goal are given. The question is often raised to what extent a job specification should go into details and prescribe the exact procedure of work. Taylor and his school of efficiency experts go, as is well known, a long way in detailed specification; they specify the "one best method," thus leaving little or no initiative for the worker to work out what he considers his best form of procedure. Lipmann thinks, however, that there are two sides to this question. What is gained on the one hand by exactly prescribing just what is the best way is often lost on the other side by an absence of interest in the work on the part of the worker. Lipmann advocates a very careful consideration of each individual case as to the extent the worker should be left free to develop his own methods.

A psychological analysis of a job reduces the capacities needed to such terms as "attention," "memory," etc. Here Lipmann uses the *Gestalt* concept, saying essentially that we should not forget that the qualities found in an analysis do not work separately, but that they are integrated in a *Gestalt*. This cannot be sufficiently represented in an analysis. If "memory" and "attention" are necessary in a certain job, it must be remembered that what is required is the coordination between the two particular capacities rather than these capacities taken separately. A job can be represented adequately only by a very detailed description of the performance, a description which allows the reader an

insight into the psychological conditions of the work and makes it possible for him to experience the entire situation. This method keeps us at the same time from a superficial juggling with ill-defined words, such as is often the case in too schematic a description. With these job descriptions as a basis a long series of *Berufsbilder*, or vocational monographs, which are especially used for vocational guidance purposes, have been written and published in Germany.

The psychological factors influencing work are given by Lipmann as: (1). The general "capacity-to-work" (*Leistungsfähigkeit*); (2) The present objective "preparedness-to-work" (objective *Leistungsbereitschaft*); and the general and momentary subjective "willingness-to-work" (subjective *Leistungsbereitschaft*).

"Capacity-to-work" means the maximal performance which a given individual could put forth under optimal conditions. The actual performance is always smaller than this capacity, for there are always certain factors which tend to decrease the efficiency e.g. chronic age or illness and indisposition. The "preparedness-to-work" is the objective evidence of the "willingness-to-work." The "willingness-to-work" depends upon: (1) The general inclination of the individual to exert himself, to put his assets to work and (2) the conditions which tend to increase or decrease this general factor temporarily, such as age, interest in the particular field, subjective fatigue, special incentives for increased effort, such as promise of a reward, etc. In order, therefore, to secure at the same time a maximum of productivity and a maximum of happiness to the worker, there must be selected for each job (1) the people who have the optimal objective preparedness-to-work for this particular job, and (2) to see to it that the quotient objective preparedness-to-work divided by subjective willingness-to-work becomes and stays as close to the unit, 1, as possible.

There are then essentially two practical problems for the industrial psychologist: The first comprises all the efforts along the lines of vocational guidance and vocational selection and here all the methods of efficient selection and placement are involved.

The creation and maintenance of a satisfactory "willingness-to-work" is the other. This problem embraces all the efforts which have been made to secure the good will and satisfaction of the worker, such as provisions for equitable monetary rewards, incentives and rewards for good work, long service rewards, a fair promotion system, profit-sharing, employee stock holding plans, and finally, provisions intended to work as the safety valves for discontent and dissatisfaction, which will eliminate the wasteful and violent weapons of strikes, lock-outs, and so on. In this category fall provisions made for "suggestion systems", "informal interviews" with officers of the company who have psychological and sometimes medical training, and "work councils," and "industrial governments."

Lipmann then goes on to explain how important it is both for the employer and the employee to make the distinction between the capacity-to-work and the willingness-to-work. He is convinced that so far industrial psychologists have often neglected to make this differentiation and that many failures in personnel studies and reorganization were due to this fact. He thinks on the other hand that the often claimed difference in efficiency between the German workman and the American workman is not due to a difference in the capacity-to-work (which if there is any difference would be in favor of the Germans), but to a difference in the willingness-to-work. The American worker is much more ready to put in a maximum effort and to do his best, whereas the German workman, as a rule, has become reluctant to do so.

The difference between the objective capacity to work and the subjective willingness-to-work is very important also in the concept of "industrial fatigue." Fatigue has been a problem for study in industry for a long time. Reduced to a simple formulation it can be put in this way: "To what pace can the machines be speeded up without causing a premature exhaustion and aging of the worker?" It is obvious that the employee should be vitally interested in this question. It is for him a question of

health and happiness, or disablement and illness, and early death. Also, the progressive employers have become more and more interested in this question, some perhaps because of humane reasons, some on account of the high cost of labor turnover and the realization that the worker of 40-45 years, with his experience and settled habits, is after all more valuable to the concern than the unsteady, unsettled young worker.

The experiments conducted in laboratories have mainly considered fatigue as a physiological phenomenon. These experiments have been restricted to the modifications of the capacity-to-work. Only with very rare exceptions have the investigators considered any modification of the willingness-to-work. They have failed to deal with industrial fatigue as a personality reaction.

Lipmann is very skeptical about the methods devised to measure industrial fatigue. He feels that the only way in which a solution can be found is by measuring the result of modifications in the capacity-to-work and willingness-to-work in terms of output or production. He insists upon this being measured by field experiments and not laboratory experiments. The actual production data, furnished by the industrial plants, is the only true measure of variations in fatigue, etc. where there are differences in the influences.

This brings to our attention the fact that one of the foremost methods of the Science of work is the statistical method. Lipmann realizes, however, that the present statistical method is by no means perfect. Good instances for the unreliability of industrial statistics are those of industrial accidents from different plants, which do not allow for a direct comparison, because terms and categories are often not sufficiently defined. A development of the statistical method is therefore strongly urged by Lipmann, especially in respect to a more exact and precise definition of the terms.

A later chapter in the book deals with "Means to Increase Production." This is to a certain extent a review of the various ways in which the principles laid down in

the previous chapters have been applied to industry. It is clear that many of these principles originated long before anybody could see a theoretical justification for them (the sanction of the psychologist has come afterwards), but in many instances at present, the personnel and industrial relations expert is consulted upon the probable effect of any change. One way to increase production is to increase the hours of work. This effect, however, is soon checked by a more than proportional decrease in intensity of work, so that better results (i.e. better and more production) have been secured by having the worker work for 44 hours a week rather than for 60 hours. Experiments along this line were made in the English Ammunition industry during the Great War. Efficient means of eliminating lost time and lost movements have been found in the motion and time studies originated by Taylor and Gilbreth and now practised in almost all progressive concerns. This is an analysis of the time and motion elements necessary in a specific job and a rearranging and standardizing of the jobs. This system gives at the same time an objective basis for the wage rates and piece rate systems. An objective basis for wage systems, of course, has demonstrated its superiority over the older ones founded on subjective values. Attempts to increase the output by "putting the right man on the right job" have resulted in the development of large personnel departments, where interviewers and psychologists cooperate in the selection of the fittest. Systems of this kind usually bring about considerable increase in the objective capacity-to-work.

The subjective willingness-to-work is stimulated by fostering a feeling of community of all the workers and the management. House organs are the most elementary device used for this purpose. The formation of building and loan associations among the workers, sponsored and subsidized by the company, have the aim and effect to increase the loyalty of the worker to the company, to get him to settle down,

and thus to keep down the labor turnover and its tremendous losses. Keeping down labor turnover is also the purpose of many savings and stock-purchasing plans which place a definite premium on staying with the company. Keeping up the willingness-to-work and keeping down discontent and its eventual consequences, such as strikes and lockouts, is also attempted by the establishment of industrial councils. Representatives of the workers and of the management meet in joint session. Problems are brought up and discussed and decisions are made. But often, the individual worker has little opportunity to ventilate his grievance by talking in such a council meeting. Then, other arrangements are made, as in the Western Electric Company, in Chicago, where Dr. Mayo of Harvard has helped to establish a system of interviews. Trained interviewers go about and talk to the men in an informal way, giving them an opportunity to speak about their personal problems, concerning the job and others, and thus to "blow off steam."

Lipmann's concluding statements relate to a philosophy for the Science of Work. The Science of Work has as its aim, on the one hand, to show the ways and means to increase production. But it has on the other hand a duty to point out, that, after all, production and industrial organization are not an ultimate goal, but rather a means. They are a means to give the largest possible number a livelihood, not only for the immediate satisfaction of the primitive desires for food and shelter, but for the attainment of a level of economic security and comfort necessary to the pursuit of cultural endeavors. It must take into consideration not only short-term efficiency, but long-term efficiency; it has to be concerned not with conditions of *maximal* production but with the conditions of *optimal* production: The "Science of Work" has as its duty the checking of all attempts to sacrifice the higher ideals of life to the machine and to the idols "production" and "industry."

Briefer Mention

INDUSTRIAL ARBITRATION IN GREAT BRITAIN. By Lord Amulree. London: Oxford, 1929, x + 233 pp., \$3.00.

The author, formerly president of the Industrial Court, traces in considerable detail the development of methods of arbitration and conciliation between employers and workpeople in British industry. Starting with the Statute of Labourers of 1388, he describes early legislation including the Act of Elizabeth for the regulation of wages and the first anti-combination law. The anti-combination law was enacted in 1799. In the next year Parliament passed a bill for compulsory arbitration of labor disputes in the cotton industry. This law of 1800, and a few similar statutes enacted in the early years of the 19th century, appear to have had comparatively little effect. They were repealed in 1824, when a new arbitration act, also generally ineffective, was passed. Soon after this, however, the growing power of trade unions led to numerous experiments in arbitration and conciliation. This activity continued through the middle and later years of the 19th century and was in full swing when the outbreak of war in 1914 changed the whole face of the industrial situation.

The concluding chapters of the book are taken up with war time labor measures and the establishment of the Whitley Councils and the Industrial Court. Of the Whitley Councils, the author says:

"The Joint Industrial Councils at present number fifty-four, covering approximately 2,500,000 workers. They vary considerably in activity; but there are no sufficient grounds for supposing that they are the mere outcome of momentary enthusiasm and will not form a permanent feature of industrial life. They have on the whole been successful in dealing with difficulties which have arisen in their respective industries and which might otherwise have led to dispute. It remains to be seen whether they will consistently act as intended by the authors of the scheme in referring to arbitration matters on which they fail to reach agreement."

Lord Amulree details the constitution and procedure of the Industrial Court, an institution upon which his verdict is as follows:

"No human institution is perfect, but it may be fairly said that the Industrial Court affords a more rational and convenient means of settling differences than has ever heretofore been devised, and that in its practice no less than in its constitution it may be regarded as the consummation of the long period of experiment and experience reviewed in these pages."

AVIATION AND LIFE INSURANCE. By Ray A. Dunn. New York: Guggenheim Fund, 1930, 112 pp.

The aeronautical industry has been embarrassed by the lack of proper life insurance facilities. In most cases coverage can be secured, but the costs are often prohibitive. Insurance underwriters have been working in the dark, since they did not have adequate statistics on which to rate the risks of aviation. Captain Dunn, to whom was entrusted the task of compiling statistics, has consulted the records of the War Department, Navy, Marine Corps, commercial companies and some European flying organizations covering a period of ten years. He has also studied the practices and experiences of 109 insurance companies. A vast amount of data is given in the appendix which should prove useful to insurance underwriters in properly classifying the hazards of aviation and establishing uniform ratings. Proposal is made for the establishment of a central statistical, rating, adjustment and legal agency.

IS IT SAFE TO WORK? A STUDY OF INDUSTRIAL ACCIDENTS. By Edison L. Bowers. New York: Houghton Mifflin Co., 1930, xiii + 229 pp., \$2.50.

Reliable authorities estimate that seventy-five per cent. of industrial accidents could be avoided. The only way to reduce their number is to make them expensive to the employer, and it is moreover only justice to require that industry compensate

injured workers and their families for losses of earning power due to accidents. This will make it possible to increase the rates of compensation, which in most States are now far from adequate. But mere increase in the amount is not enough; the payments should be carefully graded, not only according to the type of injury, but also according to the age, sex and occupation of the worker, and the size of his family. Closely cooperating with the administrators of workmen's compensation should be a board for vocational rehabilitation, to train the worker and find a place for him again.

WOMEN AND THE PH.D. By E. J. Hutchinson. 1929, x + 212 pp.; **FELLOWSHIPS AND OTHER AID FOR ADVANCED WORK.** By G. H. Johnson, 1930, 413 pp. Bul. nos. 2 & 3 of the Institute of Women's Professional Relations, N. C. Col. for Women, Greensboro, N. C.

Bulletin No. 2 is based on a study of 1,025 women who are doctors of philosophy, presenting material on the cost of graduate study, circumstances in which dissertation was written, effect of degree on professional advancement, earnings, marriage and work of these women with degrees, etc. Bulletin No. 3 is a compilation of material concerning opportunities for receiving aid in advanced study. Both volumes are of value to all who are concerned with the problems investigated.

A POINT SCALE OF PERFORMANCE TESTS. By Grace Arthur. New York: The Commonwealth Fund, 1930, ix + 82 pp., \$1.50.

A clinical manual for the administration of a general intelligence performance scale with two forms. Volume II (to be published later) contains an account of the work of standardization covering a period of ten years and supported by a grant from the Commonwealth Fund. Mental age norms are given for ages five to fifteen for Form I and six to twenty-one for Form II based upon 1100 normal public school children. Fifty per cent of the cases tested with Form I averaged only a five point change in I.Q. when given the Binet. The average differences between Form I and

Form II of the performance test was between four and eight I.Q. points for the various ages.

STATISTICS FOR TEACHERS. By Ernest Triegs and Claude Crawford. New York: Houghton-Mifflin, 1930, 212 pp., \$1.90.

This book is aimed to meet the demands of educational workers who have had little training in mathematics and statistics in order to enable them to understand the statistical treatment in psychological and educational literature of the day. It is recommended as an elementary text for a beginning class in educational statistics. There is no attempt to explain the mathematical derivation of formulas; the significance of the more important statistical operations are lucidly explained in the terms of the lay man, and their uses are shown by simple illustrations. The more complicated phases of statistical analysis are merely pointed out, leaving such treatment for more advanced texts. A set of true-false tests at the end of each chapter enable the student to determine whether or not he has understood the material presented.

YOU AND YOUR JOB. By James J. Davis and John C. Wright. New York: Wiley, 1930, xi + 242 pp.

In this book the authors treat the topics that should be considered by young people in thinking about their vocation. Perhaps its content can best be expressed in the phrase "attitudes towards work." Specific topics treated are: Why We Work, A Job for Every One, Choosing your Job, Training and Education, Getting the Job, Your Relationship to Your Job, Your Employer, Your Home, Your Country and Yourself. The book is written as a series of conversations between Messrs. Davis and Wright and naturally reflects their own experiences.

THE CONSISTENCY OF CERTAIN EXTROVERT-INTROVERT BEHAVIOR PATTERNS OF FIFTY-ONE PROBLEM BOYS. By Theodore Newcomb. New York: Columbia Univ. Press, 1929, 121 pp., \$1.50.

This study is an examination of the value of the introvert-extrovert concept in consulting psychology. A group of fifty-one

problem boys were studied under camp conditions in an attempt to ascertain if they displayed consistent behavior patterns of such a kind that extrovert and introvert types could be distinguished on the basis of objective observation. There was found to be no cases of consistent reactions to twenty-six objective behavior situations—either of the introvert type or extrovert type, as generally understood. The correlation is .14. Submissive reactions to some situations and ascendant reactions to others would mark the inconsistency which was found. Consistency and inconsistency in these reactions follow roughly the normal curve. The logical classifications of introvert-extrovert behavior are found to be of no value as far as this group is concerned.

THE ENLARGEMENT OF PERSONALITY.

By J. H. Denison. New York: Scribner's, 1930, xxi + 340 pp.

The forces that mold, change and develop the personality are analyzed in this book. The point of view is interactionist with adequate recognition of the place of outer and inner causative factors in helping to bring about enlargement. The basic purpose is to show these various influences at work to bring about changes in the self. This purpose is interestingly realized. But the book seems unsatisfying because the exposition is so largely of the "what" and hardly at all of the "how." One may gain certain information and perhaps a valuable way of looking at the problem of personality growth. But the present reviewer misses any suggestions of a creative sort. In his omission of these interpretive and methodological considerations, the author may have been deliberate, but in so doing he has written only a rather soulless treatise and not a stimulating aid to wiser living.

BUSINESS SPEECHES BY BUSINESS MEN.

Compiled by William P. Sanford and Willard H. Yeager. New York: McGraw-Hill, 1930, viii + 747 pp., \$5.00.

The authors of "Business and Professional Speaking" have compiled a companion volume intended to furnish illustrative material for students of the art of effective speech. About seventy-five addresses are

included, grouped under the following general topics: Discussions of Policies; Inspirational Speeches; Goodwill Speeches; Promotional Speeches; Explanations and Instructions; Oral Reports; Speeches of Courtesy; The After-dinner Speech; The Radio News Broadcast. Most of the speeches are by well-known business leaders and some of them have previously been widely circulated. The subjects and methods of treatment show sufficient variety to make the book worthy of at least a casual survey by the general reader, and it has undoubted value as laboratory material for the analyst.

THE ART OF BUSINESS THINKING. By H. G. Schnackel. New York: Wiley, 1930, 147 pp., \$2.50.

This small volume attempts to put before an executive the answer to two questions: (1) What do we do when we think? (2) What should we do to improve thinking? The answers, to be of greatest use, require psychological discussion and concrete illustration of actual thought problems such as executives must face. The author has found plenty of psychological material but is short on practical illustrations.

METHODS IN INDUSTRIAL EDUCATION. By F. T. Struck, New York: John Wiley, 1929, xi + 214 pp., \$2.75.

This volume covers the necessary topics, but the method and length are such that the result is sketchy to a degree. No reader without considerable background on the various topics treated can go far with what is given here. Particularly the vital subject of learning and teaching psychology suffers unfortunately from this condensed presentation.

HISTORY AND ORGANIZATION OF EDUCATION IN PENNSYLVANIA. By Louise G. Walsh. Indiana, Pa.: Grosee Print Shop, 1930, 406 pp., \$3.25.

An account of education in Pennsylvania from the first special provisions made in 1683 to the present time. Deals mostly with public education. Especially useful as a text book in institutions for the training of teachers.

GEORGE EASTMAN. By Carl W. Ackerman.
Boston: Houghton-Mifflin, 1930, xviii +
521 pp., \$5.00.

This life of the eminent manufacturer is of chief interest to the personnel worker in the light it throws on problems of developed labor policies. An interesting feature is the account of Mr. Eastman's inauguration of a program of industrial research, a field in which he was a pioneer.

SIMPLIFIED TOUCH TYPEWRITING. By R. F. Webb. New York: Prentice-Hall, 1930, v + 140 pp., \$1.50.

A text adequate for either the classroom or the beginner at home. The lessons, amply illustrated and emphasizing correct position, fingering technique and form, start with simple exercises and progress to involved copy work. They are so arranged as to enable the beginner to become an efficient typist with a minimum expenditure of time and effort.

THE GREAT APES. A STUDY OF ANTHROPOID LIFE. By Rober M. Yerkes and Ada W. Yerkes. New Haven: Yale Univ. Press, 1929, xix + 652 pp., \$10.00.

Collected together in this volume is what is known of anthropoid life. The orang-outan, chimpanzee and gorilla (those great apes nearest to man) and the gibbon and siamang (those nearest to monkey) are described in historical and experimental perspective. There was knowledge of in-frahuman privates 3000 years ago. Historical record begins with Aristotle. But it remained until the 19th century before the great apes were identified with any degree of exactness. Experimental apparatus for the study of anthropoid behavior is described. Descriptive and pictorial records are offered of hygiene, infancy and development, habits of motor dexterity, emotional patterns, intellectual alertness and so on. Pictures show the orang-outan admonishing a proboscis monkey and the surprise responses of a young chimpanzee as he sees his reflection in a mirror. The book is a comparative psychobiological record of man's closest relatives.

THE FOUNDATIONS OF EXPERIMENTAL PSYCHOLOGY. Carl Murchison, Editor.

Worcester: Clark Univ. Press, 1929, x + 907 pp., \$6.00.

The Foundations of Experimental Psychology is written by twenty or more prominent scientists who have contributed chapters upon heredity, the physiology of the reaction, the reception of stimulation and the study of the various senses, the physiological basis of emotions and their expression, the experimental study of the learning process, the genetic study of the individual, his abilities and their measurement, social and abnormal psychological problems, and use of statistics in the field of psychology. Among the contributors are Parker and Cannon of Harvard, Banister of Cambridge, Lashley and Freeman of Chicago, Gesell and Wissler of Yale, Franz of California and Kelly of Stanford. In the chapter by Mark May, upon "The Adult in the Community," the assumption is made that the place of the adult in the community is determined and defined by the way in which he differs from others. The study of the individual as an infant, and his abilities in school is the subject of three other chapters in this book upon experimental foundations. As an indication of differences in experimental opinion upon the nature of the learning, Lashley, in his chapter upon "Nervous Mechanisms in Learning," says of the conditioned reaction, "the evidence from many lines of investigation opposes interpretation of learning as the formation of definite 'conditioned-reflex axis' . . ." (p. 561), while Hunter, in his chapter upon "Experimental Studies of Learning" says, ". . . all learning is fundamentally of the conditioned-reflex type . . ." (p. 622).

GENERAL PSYCHOLOGY FOR COLLEGE STUDENTS. By C. N. Rexroad. New York: Macmillan, 1929, ix + 392 pp., \$2.10.

An introductory text written from the behaviorist's point of view, the book first examines scientific principles and assumptions underlying that point of view. Biological and physiological concepts relative to human behavior are then presented. In the following section great emphasis is placed on the fundamental principles of maturation and learning. The remainder of the book is concerned with the more

important characteristics of adult behavior, with discussion of common characteristics and treatment of individual differences. A large part of this is a reinterpretation of data of non-behavioristic psychologists.

TEN THOUSAND SMALL LOANS. By Louis N. Robinson and Maude E. Stearns. New York: Russell Sage, 1930, 154 pp., \$2.00.

To secure the data for this study, questionnaires were sent monthly during 1923 to 211 small loan offices in the eastern half of the United States. Ten thousand replies were received each representing data regarding a single loan. The questions covered such facts as the social and economic status of the borrower, the conditions under which he lived and data regarding the security for the loan and its payment in installments. This is part of a series of studies supporting the Russell Sage Foundation in its legislative activities on behalf of the uniform small loan laws, now adopted by 18 states.

AMERICA LOOKS ABROAD. By Paul M. Mazur. New York: Viking, 1930, xv + 299 pp., \$3.00.

America can continue to sell to Europe more than she buys from Europe only so long as she can lend Europe the money to pay for the goods. But fresh loans from America cannot always balance the growing interest charges, and eventually America will be obliged to accept a surplus of imports in payment. This will mean the end of her "favorable" balance of trade; it does not necessarily involve a loss of her commercial supremacy. High tariff rates will only bring on a tariff war and injure both sides.

SOVIET ECONOMIC DEVELOPMENT AND AMERICAN BUSINESS. By Saul G. Bron. New York: Liveright, 1930, xiii + 147 pp., \$1.50.

This is a progress report on the first year of the Five-year Plan under which Soviet Russia is transforming itself into an industrial nation. The complete program requires an enormous expenditure for machinery, especially tractors and other agricultural implements. If trade relations

between the United States and Russia are facilitated, these purchases will be made largely in this country.

READINGS IN SOCIOLOGY. By Wilson D. Wallis and Malcolm M. Willey. New York: Knopf, 1930, xxiv + 639 + xxvi pp.

The editors have selected material from a variety of sources, chiefly periodicals. The attempt has been made not merely to present data about our present social organization but to provide indications of trends which may be of vital significance to the future. There are six parts: The cultural approach to sociology, the nature of social change, physical and biological factors, social psychology, social change and social institutions, and the wider significance of social change. Designed primarily for use with college classes the book should also serve the reader who wishes a comprehensive survey of modern society.

AMERICAN SEX PROBLEMS. By Dinshah P. Ghadiali. Malaga, N. J.: Spectro-Chrome Inst., 1929, 242 pp., \$3.00.

A naturalized American, born a Parsee, the president of the Spectro-Chrome Institute, is another of the loyal sons of India who would like to do something to Katherine Mayo. The idea back of this book appears to be a turning of the tables, by which abuses attributed to India are matched with episodes from the United States, not to show how dreadful is American life but to make clear the absurdities of Katherine Mayo's generalizations.

HUMAN NATURE AND CONDUCT. By John Dewey. New York: Modern Library, 1930, vii + 336 pp., \$.95.

This addition to the popularly priced list of the Modern Library of what many readers consider to be Dewey's best book—the most vivid and pointed, if not the most ambitious in scope—is sure to be welcomed. In a new foreword written for this edition, Mr. Dewey declares that, while he believes that a knowledge of human nature provides us with the map or chart for understanding the social sciences, he agrees with neither

the nativistic nor the environmentalist interpretations of man's nature. Rather it is to be explained through the balanced interplay of two forces: on the one hand, through the action of certain common, intrinsic traits in men which help to shape social life, and, on the other hand, through the power of culture, social habits, and institutions to mold and diversify human

nature. Whereas a few years ago there was an exaggerated emphasis in psychology upon the first (i.e. upon instincts), today there is perhaps an undue tendency to ignore the basic identities in human endowment in favor of these divergent social manifestations. In this book he is concerned to show that morals are a function of the interaction of both these forces.

New Books

LABOR RELATIONS

INDUSTRIAL MIGRATION IN THE UNITED STATES, 1914-1927. By H. H. McCarty. Iowa City: Univ. of Iowa, 1930, 79 pp., apply.

THE PAST AND PRESENT OF UNEMPLOYMENT INSURANCE. By W. R. Beveridge. New York: Oxford, 1930, 48 pp., 70¢.

THE WORK OF PLACEMENT OFFICES IN TEACHER TRAINING INSTITUTIONS. By W. Brogan. New York: Columbia Univ., 1930, 434 pp., \$1.50.

UNEMPLOYMENT; A PRACTICAL PROGRAM. By H. R. Mussey. New York: League for Independent Political Action, 1930, 12 pp., apply.

UNEMPLOYMENT A PROBLEM OF INDUSTRY. By W. H. Beveridge. New York: Longmans, 1930, 541 pp., \$7.50.

OCCUPATIONAL ANALYSES

CHILD LABOR: FACTS AND FIGURES. By U. S. Children's Bureau. Washington: Gov't Pr. Off., 1930, 141 pp., 25¢.

EARNINGS OF WOMEN IN BUSINESS AND THE PROFESSIONS. By Margaret Elliott and G. E. Manson. Ann Arbor: U. of Mich., 1930, 222 pp., \$1.50.

EFFECT OF NOISE ON HEARING OF INDUSTRIAL WORKERS; A STUDY OF A GROUP OF WORKERS IN NOISY INDUSTRIES. By Bureau of Women in Industry. Albany: N. Y. State Dept. of Labor, 1930, 42 pp., apply.

VARIATIONS IN EMPLOYMENT TRENDS OF WOMEN AND MEN. By U. S. Women's Bureau. Washington: Gov't. Pr. Off., 1930, 150 pp., 50¢.

PSYCHOLOGICAL TESTS

EDUCATIONAL MEASUREMENT IN HIGH SCHOOL. By C. W. Odell. New York: Century, 1930, 655 pp., \$3.25.

WORK-BOOK IN EDUCATIONAL MEASUREMENTS; FORMS A AND B. By H. A. Greene. New York: Longmans, 1930, 160 pp. ea., \$1.50 ea.

GUIDANCE

COURSES AND CAREERS. By R. P. Gallagher. New York: Harper, 1930, 425 pp., \$1.40.

SELLING YOURSELF. By E. F. Dalton. New York: Ripton, 1930, 161 pp., \$2.00.

MENTAL HEALTH

PSYCHOPATHOLOGY AND POLITICS. By H. D. Lasswell. Chicago: U. of Chicago, 1930, 294 pp., \$3.00.

PSYCHOPATHOLOGY; A SURVEY OF MODERN APPROACHES (foreword by W. H. Stoddard). By J. E. Nicole. New York: Dodd Mead, 1930, 215 pp., \$4.00.

MANAGEMENT AND ADMINISTRATION

A PHILOSOPHY OF PRODUCTION; A SYMPOSIUM. By J. G. Frederick. New York: Business Course, 1930, 271 pp., \$4.00.

BUSINESS CHARTS. By T. G. Rose. New York: Pitman, 1930, 104 pp., \$3.00.

CREDIT AND ITS MANAGEMENT. By J. H. Tregoe. New York: Harper, 1930, 204 pp., \$3.00.

EDUCATION FOR BUSINESS MANAGEMENT. By J. A. Bowie. Oxford: Oxford U., 1930, 200 pp., 8s. 6d. net.

MANAGEMENT PROBLEMS; WITH SPECIAL REFERENCE TO THE TEXTILE INDUSTRY. By G. T. Schwenning, Ed. Chapel Hill: U. of N. C., 1930, 280 pp., \$2.00.

OUR BUSINESS CIVILIZATION; SOME ASPECTS OF AMERICAN CULTURE. By J. T. Adams. New York: Boni, 1930, 315 pp., 50¢.

THE ART OF BUSINESS REASONING. By H. F. Schnakel and A. L. Sprecker. London: Chapman & Hall, 1930, 327 pp., 17s.6d. net.

INDUSTRIAL EDUCATION

ACCOUNTING PRINCIPLES AND PROCEDURE (ed. by E. S. Furniss). By W. J. Goggin and J. W. Toner. Boston: Houghton, 1930, 484 pp., \$3.50.

AVIATION ENGINE EXAMINER. By V. W. Pagé. New York: Henley Pub., 1930, 448 pp., \$3.00.

EDUCATION AND LIFE. By E. M. Hopkins. Boston: Houghton, 1930, 53 pp., \$1.50.

EDUCATIONAL ACHIEVEMENT IN RELATION TO INTELLIGENCE. By C. W. St. John. Cambridge: Harvard, 1930, 233 pp., \$3.50.

SIMPLIFIED TOUCH TYPEWRITING. By R. F. Webb. New York: Prentice-Hall, 1930, 158 pp., \$1.50.

THE MARKS OF AN EDUCATED MAN. By A. E. Wiggam. Indiana: Bobbs-Merrill, 1930, 339 pp., \$3.00.

VOCATIONAL INFORMATION

AN INTRODUCTION TO JOURNALISM; AUTHORITATIVE VIEWS ON THE PROFESSION. By L. W. Murphy, Ed. New York: Nelson, 1930, 406 pp., \$2.50.

HOW THEY CARRIED THE MAIL; FROM THE POST RUNNERS OF KING SAIGON TO THE AIR MAIL OF TO-DAY. By Joseph Walker. New York: Sears, 1930, 315 pp., \$3.00.

OPPORTUNITIES FOR VOCATIONAL TRAINING IN NEW YORK CITY. By Vocational Service for Juniors. New York: Compiler, 1930, 111 pp., 50¢.

STRUGGLE, THE STIRRING STORY OF WOMAN'S ADVANCE IN ENGLAND. By R. C. Strachey. New York: Duffield, 1930, 429 pp., \$3.50.

THE WONDERFUL STORY OF INDUSTRY. By E. F. Baker. New York: Crowell, 1930, 317 pp., \$2.50.

PSYCHOLOGY

AN INTRODUCTION TO THE PSYCHOLOGY OF THE CLASSROOM. By C. E. Holley. Boston: Heath, 1930, 270 pp., \$2.00.

BEHAVIORISM (rev. ed.) By J. B. Watson. New York: Norton, 1930, 319 pp., \$3.00.

COMMON ANNOYANCES; A PSYCHOLOGICAL STUDY OF EVERY-DAY AVERSIONS AND IRRITATIONS. By Hulsey Cason. Princeton: Psychological Review Co., 1930, 223 pp., \$3.25.

HYPNOTIC POETRY; Foreword by James H. Leuba. By E. D. Snyder. Philadelphia: U. of Pa., 1930, 173 pp., \$2.00.

MENDEL'S PRINCIPLES OF HEREDITY. By William Bateson. New York: Macmillan, 1930, 427 pp., \$5.00.

MINNESOTA MECHANICAL ABILITY TESTS. By C. B. Elliott and others. Minneapolis Univ. of Minn., 1930, 586 pp., \$5.00.

PSYCHOLOGICAL EXERCISES. By A. R. Orage. New York: Farrar & Rinehart, 1930, 68 pp., \$1.25.

PSYCHOLOGY OF EARLY CHILDHOOD; UP TO THE SIXTH YEAR OF AGE (2nd ed.). By William Stern (tr. by Anna Barwell). New York: Holt, 1930, 623 pp., \$5.00.

PSYCHOLOGY FOR ADVERTISERS. By D. B. Lucas and C. E. Benson. New York: Harper, 1930, 366 pp., \$5.00.

PSYCHOLOGY OF INFANCY AND EARLY CHILDHOOD (new 2nd ed.). By A. H. Arlitt. New York: McGraw, 1930, 382 pp., \$3.00.

SOCIAL PSYCHOLOGY. By Kimball Young. New York: Crofts, 1930, 721 pp., \$4.00.

THE GROWTH OF ABILITY. By R. O. Filter and O. C. Held. Baltimore: Warwick and York, 1930, 181 pp., \$2.28.

THE MENTAL DEVELOPMENT OF THE CHILD; A SUMMARY OF MODERN PSYCHOLOGICAL THEORY. By Karl Bühler (trans. by Oscar Oeser). New York: Harcourt, 1930, 181 pp., \$3.00.

THE PROMISE OF YOUTH. By B. S. Burks and others. Stanford: Stanford Univ., 1930, 522 pp., \$6.00.

THE PSYCHOLOGY OF ACHIEVEMENT. By W. B. Pitkin. New York: Simmon & Schuster, 1930, 513 pp., \$3.50.

THE PSYCHOLOGY OF THE COMMON BRANCHES; WITH ABSTRACTS OF THE SOURCE MATERIAL. By W. H. Pyle.

Baltimore: Warwick & York, 1930, 388 pp., \$2.10.

ECONOMICS

ECONOMIC PROBLEMS AND CASES, REVISED. By C. C. Thomason. Rochester: Rochester Athenaeum & Mechanic Inst., 1930, \$1.75.

ECONOMIC THEORY OF THE LEISURE CLASS. By Nikolai Bukharin. New York: Int'l. Pub., 1930, \$1.50.

FUNDAMENTAL OF ECONOMICS; A TEXTBOOK FOR INTRODUCTORY COLLEGE COURSES IN ECONOMIC PRINCIPLES. By P. F. Gemmill. New York: Harper, 1930, 501 pp., \$3.00.

GERMANY: ECONOMIC CONDITIONS. Overseas Trade Dept. Report. London: H. M. S. O., 1930, 4s. 6d. net.

RATIONALISATION AND UNEMPLOYMENT; AND ECONOMIC DILEMMA. By J. A. Hobson. New York: Macmillan, 1930, 126 pp., \$1.75.

SOCIOLOGY

ADAM FERGUSON AND THE BEGINNINGS OF MODERN SOCIOLOGY; AND ANALYSIS OF THE SOCIOLOGICAL ELEMENTS IN HIS WRITINGS WITH SOME SUGGESTIONS AS TO HIS PLACE IN THE HISTORY OF SOCIAL THEORY. By W. C. Lehmann. New York: Columbia Univ., 268 pp., \$4.25.

CRIME AND THE CRIMINAL LAW IN THE UNITED STATES; CONSIDERED PRIMARILY IN THEIR PRESENT SOCIAL ASPECTS. New York: Macmillan, 1930, 632 pp., \$6.50.

ECONOMIC HISTORY OF THE AMERICAN PEOPLE. By E. L. Bogart. New York: Longmans, 1930, 809 pp., \$3.50.

ENCYCLOPAEDIA OF THE SOCIAL SCIENCES. By E. R. Seligman and A. S. Johnson, Eds. New York: Macmillan, 1930, 722 pp., \$7.50.

NEW GIRLS FOR OLD. By P. M. Blanchard

and C. Manasses. New York: Macaulay, 1930, 293 pp., \$2.50.

PRINCIPLES OF SOCIOLOGY. By E. S. Ross. New York: Century, 1930, 611 pp., \$4.00.

SEXUAL LIFE IN ANCIENT INDIA; A STUDY IN THE COMPARATIVE HISTORY OF INDIAN CULTURE. By J. J. Meyer. New York: Dutton, 1930, 610 pp., \$10.50.

SOCIAL LAWS; A STUDY OF THE VALIDITY OF SOCIOLOGICAL GENERALIZATIONS. By Kyung D. Har. Chapel Hill: U. of N. C., 1930, 268 pp., \$4.00.

SOCIOLOGICAL THEORY AND SOCIAL RESEARCH. By C. H. Cooley. New York: Holt, 1930, 358 pp., \$3.00.

SOCIOLOGY (rev. ed.) By E. C. Hayes. New York: Appleton, 1930, 813 pp., \$3.50.

THE CONTRIBUTION OF ECONOMICS TO SOCIAL WORK. By Amy Hewes. New York: Columbia Univ., 1930, 139 pp., \$2.00.

THE SECOND TWENTY YEARS AT HULL-HOUSE, SEPTEMBER, 1909, TO SEPTEMBER 1929; WITH A RECORD OF A GROWING WORLD CONSCIOUSNESS. By Jane Addams. New York: Macmillan, 1930, 426 pp., \$4.00.

THE SUBSTANCE OF THE SOCIOLOGY OF LESTER F. WARD. By Clement Wood. New York: Vanguard, 1930, 198 pp., 75¢.

PHILOSOPHY

GREAT PHILOSOPHIES OF THE WORLD. By C. E. Joad. New York: Cape & Smith, 1930, 128 pp., 60¢.

HUMANISM AS A WAY OF LIFE. By J. G. Frederick. New York: Business Course, 1930, 351 pp., \$3.00.

THE DEVELOPMENT OF MODERN PHILOSOPHY (Ed. by W. R. Sorley). By Robert Adamson. London: Blackwood, 1930, 364 pp., 10s. 6d. net.

THE LABOR PHILOSOPHY OF SAMUEL GOMPERS. By L. S. Reed. New York: Columbia Univ., 1930, 190 pp., \$3.00.

Current Periodicals

PREPARED BY LINDA H. MORLEY, *Industrial Relations Counselors, Inc.*

AGE

More people now live to old age. *United States Daily*, November 10, 1930, vol. 5, p. 2767-2774.

Extension of average life expectancy has resulted almost altogether from saving infants, children and young adults. Number of persons who reach 70 and 80 greatly in excess of former times, but there is no evidence that a particular individual can or does live longer now than before.

Statement issued by State Department of Public Health, of Illinois.

AMERICAN MANAGEMENT ASSOCIATION— INSURANCE DIVISION

Insurance division of the American Management Association. *Insurance Age-Journal*, November 10, 1930, Vol. 58, p. 3-5, 12.

Purpose of Insurance Division is to provide channels by which insurance executives can come into close touch with the operations and problems of all forms of commercial and industrial businesses and other enterprises.

ANNUITIES

Lincoln, Leroy A. (First Vice-President, Metropolitan Life Insurance Company). Life insurance in the employer-employee relation. *Industrial Relations*, November 1, 1930, Vol. 1, p. 37-40.

Description of Metropolitan's group annuity pension programs.

BONUS SYSTEM

Cowdrick, Edward S. Dulling the axe of dismissal. *Nation's Business*, October, 1930, Vol. 18, p. 47-49, 212-213.

Number of employers have adopted plan

of paying laid-off cash indemnities, usually paid in lump sum. Greatest value is that it gives time to look for new job, and the employer, the local chambers of commerce and other public organizations can help.

New York and Queens County Railway. Bonus plan works well. *Electric Railway Journal*, August, 1930, Vol. 74, p. 513.

"Receipts have been increased, accidents have been reduced and employment has been stabilized since employees have shared in earnings."

COLLEGE MEN IN BUSINESS

Donald, W. J. (Ph.D., Managing Director, American Management Association). Cooperation between the university and business in training and placing the college man. *Journal of Business*, October, 1930, Vol. 3, Part 2, p. 6-31.

Author thinks that if those courses are removed from the college curriculum which tend to make the graduate think he knows exactly how business is managed; if he is sent out from college feeling that graduation is really the commencement of life-time of education, then he will be more tolerant of his conditions of employment, less unsettled during the dangerous first years after graduation, and will grow more easily toward positions of responsibility.

Suggests closer knitting of the educational values that lie in the college and the training values that lie in business activity itself.

CO-OPERATION

Johnson, Don A. (Director, Empire State School of Printing, Ithaca, N. Y.).

Printing schools teaching value of co-operation between workers. *Editor and Publisher*, Oct. 25, 1930, Vol. 63, p. 38.

Broad view of all phases of newspaper publishing necessary to high standard production, printing school director says. The executives on dailies are too busy to train their staffs, and young men, interested in the operating of a newspaper may enter these technical schools and learn how to sell advertising, build up circulation, set type, collect their accounts, and direct community work.

CREDIT UNIONS

Bergengren, Roy F. Riding the credit-union circuit. *Survey*, November 1, 1930, Vol. 65, p. 137-141, 176.

Credit union is sort of bank, self-managed and functioning under supervision of some state department. Happy discoveries are made in credit union work, finding that banking can be humanized.

Filene, Edward A. Spread of credit unions. *Survey*, November 1, 1930, Vol. 65, p. 132-135, 176, 178, 180-181.

Thirty-two states have enacted legislation permitting the organization of credit unions, and regulating their conduct in public interest. Have assets of over 45 million and do loan business of 60 million a year. Approximately 40 per cent of existing unions are in industrial groups and 30 per cent in government agencies and public utilities.

EDUCATION

Jones, Winnafred (Secretary to A. L. A. Adult Education Office) Comp. Bibliography of educational directories. *Adult Education and the Library*, October, 1930, Vol. 5, p. 118-123.

Arranged by cities, states, Canada and Great Britain.

EMPLOYEE REPRESENTATION IN MANAGEMENT

Yoemans Brothers Company. Co-operation experiment. *Industrial Relations*, November 1, 1930, Vol. 1, p. 11-13.

Baltimore and Ohio co-operative plan,

successful in railroad applications, now extended to manufacturing.

EXECUTIVES

Chase, E. L. What makes a \$20,000 a year man? *System*, Aug. 1930, Vol. 58, p. 109-111.

Thousands of \$5,000 men are able perhaps to perform the routine operations of a key position, but the top executive must be able not only to do, but create and to cause to be done; more work is done by the dray horse than the race horse, but the race horse has the money value.

FACTORY LOCATION

Building of American plants abroad said to affect prosperity. *United States Daily*, Nov. 8, 1930, Vol. 5, p. 2753-2764.

"Expatriation and machine displacement of labor vital problems, states Senator Vandenberg of Michigan."

FATIGUE

Crowden, G. P. (M.Sc., L.R.C.P., M.R.C.S.) Industrial efficiency and fatigue. *Journal of National Institute of Industrial Psychology*, October, 1930, Vol. 5, p. 193-201.

Paper included the following topics: Men and machines; German Institute for the Physiology of Labour; nutrition and efficiency; other factors affecting efficiency; measurement of air conditions; health and welfare work in America; measurement of energy expenditure; length of working day; the "Dinta" system.

Lyndon, Nancy. Science discovers how to speed up the tired worker. *Office Economist*, October, 1930, Vol. 12, p. 7-8.

Tests were given to twenty girls, three times a day—9:30, 2:30 and 4:30, and continued for four weeks. Results showed a "lag" of energy in mid-afternoon. Small quantities of concentrated food taken by the one group seemed to overcome this tendency, and Dr. T. L. Bolton, head of the Department of Psychology of Temple University, who has just concluded these tests, suggests that

quick-action foods will act as an emergency ration, and supply calories needed for the rest of the day's work.

HEALTH

Health promotion in the public utility industry, its necessity and importance. National Electric Light Association, *Proceedings*, 1929, Vol. 86, p. 1552-1561.

"Development of medical department as factor in reduction of absenteeism from work. Bibliography."

Martin, Etienne (Lyons). Factory surgeons. *Occupation and Health*, 1930, Brochure no. 228, p. 1-9.

"The physician in industry is one who applies the principle of modern medicine and surgery to the industrial worker, sick or well, supplementing the remedial agencies of medicine by the sound application of hygiene, sanitation and accident prevention; and who has an adequate and co-operative appreciation of the social, economic and administrative problems and responsibilities of industry in its relation to society."

Oliver, T. Health of coke-oven and by-product workers. *Iron and Coal Trades Review*, London, June 6, 1930, Vol. 86, p. 924.

Complaints of workers at hydraulic mains and other maladies to which coke-plant employees are especially susceptible. From article in *British Medical Journal*.

INDUSTRIAL RELATIONS

Erb, Donald M. Worker, technician, owner—a study in group conflict. *Commonwealth Review*, University of Oregon, October, 1929, Vol. 11, p. 89-107. (Abstract in *Social Science Abstracts*, October 1930, Vol. 2, p. 1582).

Imperfections of the economic order are magnified by the recurrence of crises and depressions. Labor unions have lessened competition between laborers, but have augmented consciousness between capital and labor. The alliance between the technicians and the owners

has not affected class struggle as much as might be expected, due mostly to the failure of the technicians to assume a dynamic rôle.

Waelbroeck, P. (Chief, Section, Administrative Division, International Labour Office). Industrial relations in the French State mines of the Saar basin; 1, 2. *International Labour Review*, June, July, 1930, Vol. 21, 22, p. 798-836; 23-45.

Brief survey of general conditions of working of Saar mines, given to show what the Administration has done to increase individual output. About 90 per cent of the 70,000 workers are organized; divided among four German unions. A French management, an entirely German staff of manual workers, and a staff of salaried employees of both Germans and Frenchmen make the industrial relations problem a real one. One of the factors in success of rationalization has been the high standard of foremen employed. Four higher-grade continuation courses are given for them.

Management has sought to obtain good will of the workers by a system of consideration and confidence. Aim has been to adapt methods of administration to demands and wishes of workers.

INSURANCE

Mills, Charles M. (Formerly Assistant to President, Standard Oil of Ohio). Cost and workings of socio-economic laws of Germany. *Iron Age*, November 13, 1930, Vol. 126, p. 1384-1385, 1437.

Superficially, the causes of decline in both general industry and iron and steel are due to general world decline, competition from France and Belgium with lower wage scales, and lack of capital. Real influence, however, seems to lie deeper. Germany is today the most advanced socialistic state in the world. Government is now responsible for prices, rents, wages and hours, and one-third of the national budget is expended on the public, while one-fourth of the population appears on the payroll annually, in one capacity or another.

JOB ANALYSIS

Donald, Edith King. Before you hire an executive analyze the job. *System*, September, 1930, Vol. 58, p. 213. (Abstract in *Management Review*, October, 1930, Vol. 19, p. 332).

Candidate should be supplied with accurate analysis of the position. Typical form with detailed job specifications accompanies article.

MACHINERY IN INDUSTRY

Douglas, P. H. Machinery and unemployment. *Current History*, October, 1930, Vol. 33, p. 42-46.

Author thinks technological unemployment is a transitional problem, rather than the permanent fate of displaced workers. Society need not fear ever-cumulating unemployment, but it should deal with it effectively.

MUTUAL BENEFIT ASSOCIATIONS

Mutual benefit associations in 1930. *Service Letter on Industrial Relations, New Series*, no. 69, Nov. 15, 1930, p. 1-3.

Information for study furnished by mutual benefit associations in 404 business organizations. Seems no tendency appears to displace employee benefit associations, and, although fewer new associations are being formed, there is a trend toward making membership in the associations compulsory. There is a tendency to raise scale of benefits; and all indications show a sounder financing on the part of the associations.

OCCUPATIONS

Retail Credit Company. Calcium carbide and acetylene. *Industry Report*, August, 1930. Vol. 5, p. 89-99.

Manufacture of calcium carbide, location of plants, classification of jobs, potential health hazards, information on specific plants, are specific topics discussed.

Retail Credit Company. Printing ink. *Industry Report*, October, 1930, Vol. 5, p. 115-125.

In the United States there are approxi-

mately 2,500 workers employed in the printing ink industry. Information concerning the manufacture of general, lithographing and intaglio ink, with a classification of jobs, in these various plants, and information on specific plants, is given.

Retail Credit Company. Rayon. *Industry Report*, Sept., 1930, Vol. 5, p. 101-113.

The extent of the artificial silk industry, with general information concerning the processes of manufacture, is discussed.

PENSIONS

Cady, Samuel H. (General Solicitor, Chicago and Northwestern Railway). Railroad pensions—a suggested plan. *Railway Age*, Nov. 15, 1930, Vol. 89, p. 1039-1041, 1048.

New approach to problem made necessary by past experiences and changing conditions. From a paper read before the Western Conference of Railway Counsel at Chicago, Sept. 30, 1930.

Employee pension plans analyzed. *Electric Railway Journal*, Aug., 1930, Vol. 74, p. 514-518.

Presents a survey covering 27 electric railways which shows unanimous agreement concerning the desirability of pensions. In almost all instances the entire cost is carried by the Company and difficulties are anticipated as the number of eligibles increase.

Jackson, Henry E. (President, Social Engineering Institute, Inc.). Trustee annuity plan at work. *Nation's Business*, Nov. 1930, Vol. 18, p. 49-52, 142, 144, 146, 148.

Westinghouse Electric and Manufacturing Company pension plan, organized on a reserve basis, assures all employees they will receive their annuity for life, whatever may happen to the Westinghouse Company. The plan is designed to yield an employee on the average, for a normal period of service, a retirement income equal to one-half his average salary.

Minimizing the "accrued liability." *Industrial Relations*, November 1, 1930, Vol. 1, p. 14-18.

Observations in support of the conclusion that one element of pension system cost is more feared than fearful.

New Jersey hearings on old age pensions. *United States Daily*, October 17, 1930, Vol. 5, p. 2522.

Results of a detailed survey of existing pension acts in New Jersey and old age pension legislation throughout the United States, were presented to the Commission. Studies planned to look into problems of municipal, county and state pensions and public agencies for the relief of dependency, including relief of dependency of old age. Research work being directed by Dr. E. A. Winslow.

Pension law in the making. *Industrial Relations*, November 1, 1930, Vol. 1, p. 29-32.

No. 1-Case of Dolge vs. Dolge, involving one of the early "pass-book" pension systems, and a leading case upon the matter of pensions as wages.

RESEARCH

Kettering, Charles F. (Vice-President and Director, General Motors Corporation; General Director, General Motors Research Laboratories). This thing called research. *Executives Service Bulletin*, October, 1930, Vol. 8, p. 1-2, 8.

In industrial research a healthy dissatisfaction with what we have should be stressed. People constantly are not satisfied, and it is task of research to unfold and discover new improvements. Thinks research department in industry should be a self-sustaining operating department.

SAFETY

Miles, G. H. Psychology of accidents. *Journal of National Institute of Industrial Psychology*, October, 1930, Vol. 5, p. 183-192.

Statistics show that 15,000 are killed and a million injured in a year by accidents. Topics discussed are: Material and

human cause of accidents; Individual liability to accident; Safety work in American transport companies; Effects of re-training; Accident proneness and general efficiency; Tests for accident liability; Types of test described; Position of controls; Method of signalling. Author thinks the human being is the central factor, and if a scientific study of his reaction to his environment be made, and the results applied in practice, some reduction in the appalling number of accidents would take place.

SALARIES

Average salaries of staff workers revealed by inland survey. *Editor and Publisher*, Oct. 25, 1930, Vol. 63, p. 101.

Editors receive \$103 on papers of from 20,000 to 40,000 circulation, advertising managers \$80; managing editors average \$75 and top reporters \$46.

STOCK OWNERSHIP

Hurst, H. Handling stock sales to employees. *Railway Age*, August 30, 1930, Vol. 89, p. 445-448.

Detailed plans involve many complexities; methods of industrial concern and railroad described; wage deduction best method.

Means, Gardiner C. (Columbia University). Diffusion of stock ownership in the United States. *Quarterly Journal of Economics*, August, 1930, Vol. 44, p. 561-592.

"Study indicates that a great distribution of stock ownership took place during the war and post-war periods, increasing both the number of stockholders and the proportion of corporate industry owned by persons of moderate means, and that afterwards, while the number of stockholders continued to increase, no appreciable shift was involved in the proportion of corporate industry owned by different income groups."

TRADE UNIONS

Brislin, Tom J. Scranton Reporters' Union unique among United States newspaper groups. *Editor and Publisher*, Oct. 25, 1930, Vol. 63, p. 50.

Bitter coal strike in 1902 created union sentiment generally and marked organization's start, with high wages and clear-cut working hours. No disputes have arisen since then with the publishers concerning working extra time during emergencies.

TRAINING

Murfit, W. J. Training the order clerk. *Gas Age-Record*, May 24, 1930, Vol. 63, p. 802-804.

The order clerk in this article refers to the clerk who receives applications for gas, determines customer's credit rating, procures or waives amount of deposit, if the former determines the amount, receives complaints or service requests and dispatches them to the shop. How this type of clerk should be trained is discussed.

TRAINING-APPRENTICES

Dutton, H. P. Only three boys have quit in three years. *Factory and Industrial Management*, November, 1930, Vol. 80, p. 961-962.

Teletype Corporation trains apprentices who stick. Course covers four years and everyone including the foreman takes the work seriously. Apprentices are selected very carefully, and the boys' interests are consulted.

Fruend, C. J. Importance of wages in apprentice training. *Machinery*, New York, August, 1930, Vol. 36, p. 956-957.

Factors to be considered in determining wage rates that will make an apprentice system successful are discussed on basis of experience of Milwaukee branch of National Metal Trades Association.

TRAINING-FOREMEN

Bundy, R. D. Is it the foreman's job to train new men? *Machinery*, New York, September, 1930, Vol. 36, p. 19-21.

Discussion of need for more thorough training in industries, and of foremen's conferences as valuable adjunct to this work.

UNEMPLOYMENT

Edgerton, John E. (President, National Association of Manufacturers). Unem-

ployment situation and an idea. *American Industries*, Sept., 1930, Vol. 31, p. 3-6.

Suggests things that the individual can do to help the unemployment situation; buy what you need now; stop thinking what the nation and state should do, and think about what each citizen individually can do to help the other fellow.

An address before National Association of Manufacturers' conference, held by Governor Horton of Tennessee, at Nashville, August 26.

Fine, N. S. Unemployment a world-wide problem. *Current History*, September, 1930, Vol. 32, p. 1119-1124.

Unemployment due to cyclical, technological and specifically national causes, is causing great suffering to millions of people. Problem is being met in part by each country in accordance with the economic or political needs and power of different classes and parties.

Wolman, Leo. Responsibility of industry for unemployment. *Advance*, October 10, 1930, Vol. 16, p. 6-7.

From an address delivered Tuesday, September 30, before National Catholic Welfare Conference in Washington.

UNEMPLOYMENT INSURANCE

Carroll, Mollie Ray. Amending the German unemployment insurance act. *Social Science Review*, September, 1930, Vol. 4, p. 452-458.

Amendment of October, 1929, dealt with scope, eligibility, scale and duration of benefits, and the corrections of abuses. To meet demands for more funds, a temporary act was passed in December, 1929, increasing rate of contribution to 3.5 per cent of wages, to be in effect until the following June. In April, another amendment set the 3.5 per cent rate for an indefinite period, and provided for state subsidy to the unemployment insurance funds. This amendment also provided for loans to be secured from the national treasury.

General Electric Company. Will General Electric unemployment plan work? *Forbes*, Aug. 1, 1930, Vol. 25, p. 22-23.

Presents comments of leading employers on the General Electric unemployment plan. A summary of the plan is given.

UNEMPLOYMENT RELIEF

Amidon, Beulah. Some plans for steady work. *Survey*, November 15, 1930, Vol. 65, p. 202-204.

Gives plans of national, state and city organizations for unemployment relief during the present emergency. Economists and social workers think that one constructive gain could come out of these "hard times, if a permanent agency, on a national scale, would study unemployment, serve as a clearing house of information, and work out constructive method of cutting down seasonal and cyclical depression."

WATER TRANSPORTATION BUSINESS

Longshore labor conditions in the United States. *Monthly Labor Review*, Oct., 1930, Vol. 31, p. 811-830.

Nature of longshore work; conditions of employment; longshore labor conditions

in major ports of United States, including New York, Boston, Philadelphia and Baltimore. Tables showing weekly and monthly earnings of longshoremen in these various cities are given.

WORKMEN'S COMPENSATION

Piggott, Clarence S. (Chairman, Industrial Commission of Illinois). Employer and the workmen's compensation act. *Labor Bulletin*, June, 1930, Vol. 9, p. 207, 222.

Suggests that the employer should know that the workmen's compensation act makes it mandatory for him to guarantee his liability for the payment of compensation; that insurance of his risk does not relieve him of his liability in case the insurance company becomes insolvent; that an employer is liable to pay compensation not only to his immediate employees, but also to employees of any contractors or subcontractors whom he engages. It is the employer's duty to furnish first aid and be able to report accidents to proper authorities. He should also have some knowledge concerning the basis of payments.

Over 160,000 employers of labor in Illinois come under Workmen's Compensation Act.

THE PERSONNEL RESEARCH FEDERATION, Inc., was organized in 1921 and incorporated in 1926 to further research relating to occupational adjustment in Industry, Commerce, Education, Government and other fields; and to advance general understanding and practical application of such research. Its work is of two kinds:

I. PERSONNEL RESEARCH

Furtherance of fundamental investigations, for the increase of knowledge about individual abilities, occupational opportunities, working conditions, supervisory relations, and the best means of bringing about satisfactory vocational adjustment in order to develop most fully the individual's capabilities, his earning power and his satisfaction and happiness in work.

Research in industrial psychology and allied fields, both on general problems and specifically for particular industries. Coordination of such research in different industries and educational centers throughout the country.

Publication of research results so as to indicate their practical value.

II. INDUSTRIAL SERVICE

Operating through headquarters staff and member organizations, the Personnel Research Federation provides consultation and service in making practical application of the results of personnel research to particular situations in business and industry. This service includes:

1. Help in planning and installing a personnel organization suited to the requirements of the particular industry; development of special staff executives to direct and supervise such work; periodic appraisal of personnel organization and staff, with recommendations.

2. Personnel audits, as a basis for forecasting future needs for executives, supervisors, operatives, salesmen, office workers, etc., and for planning the firm's program of selection, training and promotion.

3. Development of systems of training and supervision of operatives, foremen, supervisors and executives so as to obtain greater earning power and satisfaction of employees as well as more efficient functioning.

4. Design and application of suitable methods to obtain (a) most effective selection of workers and (b) best promotion plans leading up to and including executive positions.

5. Research planning and direction of safety programs for public utilities, fleet owners, distributors and industrial plants.

6. Investigation of conditions in order to realize (a) the maximum health, safety and security of employees, (b) the best relations between employer and employee, (c) minimum labor turnover, and (d) the best distributions of work and rest periods, reduced monotony and improved morale.

7. Help to national associations and social agencies in planning recruitment, selection and development of field representatives and executive personnel.

Interested persons who desire help in solving their problems, or who want to have special research carried out, or who would like to assist in carrying forward this humane and nationally important work are invited to correspond with The Director, Personnel Research Federation, Engineering Societies Building, 29 West 39th Street, New York.

Color Blindness in Dry Goods Salesmen

BY W. R. MILES AND HOMER CRAIG, JR., *Stanford University*

Many a personal peculiarity may become either an occupational liability or an asset. Color blindness in necktie salesmen is an instance in point. But if such a trait is to be an asset, it must be known and properly dealt with by the employment manager. In the San Francisco stores, where Professor Miles and Mr. Craig made their survey of 375 salesmen who were selling colored goods, they found 27 whose color vision was definitely defective. Evidently the Ishihara test for color blindness should be on the desk of every employment interviewer in department stores.

A young man who proved color-blind claimed that he had worked with success as a salesman in a men's clothing store and that he had gained an enviable reputation for being able to select ties to match men's suits. This interesting case suggested that color-blindness might possibly have a particular place or service to fulfill in industry. Brightness matching is secondary to chroma matching, but if well done makes the matched combination perfect.

In San Francisco and vicinity 375 dry goods salesmen were tested individually for color-blindness by means of the Ishihara plates. No women were tested. The examinations revealed 27 well-marked cases of color-blindness who were actually selling colored materials. The percentage of salesmen found to have note-worthy color defect is therefore 7.2, which is only slightly less than that found among university students. From this it appears that the occupation of selling colored materials may automatically exclude the three or four worst cases (most nearly completely color-blind individuals) who occur in a population of three or four hundred. But every department, with the possible exception of silk counters, had its quota of color-blind salesmen. From follow-up studies it is very evident that many of these salesmen constitute a liability to the concerns for which they work. The authors strongly recommend that the Ishihara test be regularly used in personnel departments of mercantile establishments for examining people who apply for positions. No case was discovered where color-blindness was being constantly used as an asset in the occupation.

A LARGE number of color-blind men, perhaps about fifty per cent, are quite unaware that they have actual defect in color vision. A typical self-description from their group is given by the following verbatim quotation: "I am not very good at colors because I never thoroughly learned their names. Some day I plan to take a little time and get up

on the subject." The Ishihara Test (1) constitutes the simplest available demonstration for convincing such cases that it isn't just a matter of taking "a little time," and often the test calls forth very interesting comments. One young man in a student group tested at Stanford University in 1927 said, when informed of the results which showed a profound defect, "It is quite impossible that I should be color-blind! I have worked a great deal in men's clothing stores and in fact in one large store was considered the best person for selecting ties to match suits. How could I possibly do this if I have any color defects?" The question was a very pertinent one as there was no doubt of his grave color-blindness. Rather than dispute the matter the investigator invited this man to stand at the side and watch several other students go through the test. To his absolute astonishment these promptly, one after another, read numbers from plates that to him were entirely blank. He was convinced by this practical demonstration that his vision differed from that of the many, that he was, unbelievable as it had seemed, color-blind.

INCEPTION OF STUDY

It occurred to us that this man when in the rôle of a clothing salesman perhaps selected the neckties on the basis of brightness. He probably pulled several from the tie-racks, saying to the customer, "Any one of these ties would go well with your suit." The customer, with perhaps sometimes the help of another salesman, both probably having normal color vision, then

selected the best chroma combination from the group of ties any one of which had the proper brightness value. Color-blindness in such a case might actually be operating as an asset, aiding the salesman in achieving a result better than could ordinarily be got by those with full color sensitivity.

Taking our cue from this case, we asked ourselves if it could be possible that industry has special places of usefulness for color-blind individuals. Perhaps every well-organized haberdashery should have its one or two high salaried color-blind employees to use generally throughout the store in matching brightnesses where the chromatic elements are so strong as to make this difficult for the ordinary person. Brightness matching is secondary to chroma matching, but it is just the additional part that when well done makes the combination perfect. If the color-blind salesman did not realize his own limitations and work within his own ability the natural supposition is that he might repeatedly have goods returned, become discouraged and finally be discharged for no other reason than this, that he was not able to perceive a distinct subjective difference between red and green. Is industry selecting or eliminating these people? The problem seems to have both practical and theoretical importance. It has prompted us to carry through a series of color vision tests on individuals employed to sell merchandise where color is a prominent factor, namely in retail dry-goods stores.

TEST PROCEDURE

Superintendents and employment managers of several leading stores of

the San Francisco Bay region were approached and practically without exception these officials expressed willingness to cooperate in our study. We arranged to conduct the tests for each group of salesmen within the store in question. In each case a place was picked out where the examination could be made with adequate natural light, and with suitable seclusion so that one person could be examined alone without observation or comments from his associates. The original contact having been made through the superintendent or personnel department, the examination was usually arranged through the training bureau, which, in each case, gave excellent cooperation. A program was drawn up with the names of the men to be examined and with a regular timeschedule of appointments. Because the defect of color-blindness is practically confined to men, men only were studied and these were chosen without discrimination from each department which had to do with the selling of color and color combinations. Typical examples of the departments included for study are men's clothing, draperies, furniture, wash and dress goods, and rugs. The managers of each department were told that a test was being conducted, and they were requested to send their men salesmen, in whatever relays they wished, to the testing headquarters which had been established in that store. Each man tested was told that the purpose of the test was to compare the performances of different ages and different occupations. It was not stated that this was a color-blindness test. Each individual was assured that the results of his performance

would not be reported to anyone in the store or connected with his employers and that his participation was simply a matter of cooperation in a scientific research. All of the men responded with ready cooperation.

The Ishihara Test¹ was used in all of the examinations according to what we call the full-display method. The color plates, or charts, in their usual mounting on the folded strip, were stretched out in one horizontal line and attached to the wall at a height of about five feet. Chalk lines parallel to the plates were made on the floor, one at four feet, and the other at ten feet from the vertical plane supporting the test. The men were admitted to the room one at a time and were tested binocularly. They passed along the four-foot line parallel to the plates, reading off the numbers and tracing the lines wherever requested so that the thirteen plates were read consecutively and in the same order. In each case the subject was squarely in front of the number to be read and at first about four feet from it. If in reading the entire series, which normally takes less than two minutes, he made no mistakes, or *one* mistake only, he was judged normal and no further testing was done. If he made several mistakes he was started again at the first of the series and a written account was made of his responses as he went along. The name and the department of each man reported in detail was added to the account of his performance.

¹ This color-blindness test is based on the fact that red and green numbers printed in dots on green and red and tan backgrounds of dots can not be seen by the red-green blind.

On the mounting above each of the thirteen plates was a white number about one-half inch high and the plates were labelled 1 to 13 by these in a series from left to right.² These small numbers in addition to designating the separate plates for the use of the examiner facilitated giving directions and questioning the men. They aided also as tests for discovery of eye defects that required different reading distances.

After the color vision test numbers, $1\frac{3}{4}$ to $2\frac{1}{4}$ inches high, had been read at the four-foot distance, each color-blind man tested went to the ten-foot mark and read the complete series (of plates) again. Before testing him at ten-foot distance we said, "Some people can read the numbers better if they stand off farther." All of the subjects seemed interested in the examination and they expressed themselves as quite willing to try at any distance, or any number of times desired. Following the ten-foot trial the subject stood again at four feet or nearer and was now asked to name the colors of some of the individual dots as pointed to.

The men who gave evidence of noticeable color defect were asked about the character of their duties in the departments in which they were working, and an effort was later made to observe in the department the actual amount of color dealt with in each case. The salesman was directly questioned in this later interview about the colors of various materials on his counter and

shelves and records were taken of his responses for solid colors, mixtures and patterns. He was then questioned on his experience, the various positions he had held, whether or not he had formerly dealt with more color, and finally as to any known color difficulty in his family or among his forebears. After this his statements were verified as far as possible, through discussion of the matter with department managers and his direct associates. In each case, an effort was made to determine the individual's status in the store; his record of returned goods from dissatisfied customers; what positions he had held prior to coming here; former positions held in this store; and his length of service in various occupations and positions.

The information received from the men themselves and from their store organizations was not satisfactory. In some cases it was untrustworthy, in others, too fragmentary. As might be expected, after having discovered that they had color defect, the majority of the men examined were somewhat reticent. They were not anxious to go into much detail about themselves and their color-blind experiences. Of course they could not but think that these remarks might endanger their positions. Information from the personnel bureaus was not very clear or complete. None of them maintained very accurate information on their employees of the type we desired. There was no record of the number of cases or sales value of returned goods sent back on account of wrong color, and no direct classification as to the comparable abilities of the various men, except so-called cost records which are

² These same numbers in extremely small type are printed on the white margin of the plates, and the same numbers are used in the fore-part of the test manual under "Explanation."

contributed to by many outside elements³

RESULTS AND COMPARISONS

Individual tests were made of 375 salesmen. One store provided 73

is fairly representative of salesmen dealing with colored fabrics used for clothing or house decorations. It was evident from the first that there were plenty of color-blind people to be found in this occupation. The complete can-

TABLE 1

Individual results for the 27 color-blind men discovered in a total group of 375 dry-goods salesmen working in and about San Francisco in 1929

MEN	ISHIHARA CHARTS BY NUMBER									
	2	3	4	5	6	7	8	9	12	13
(Normal)	(8)	(6)	(5)	(74)	(2)	(6)	(5)	(7)	(26)	(42)
Color-blind										
1	8	5	5	21	6	2	5	7	25	42
2	—	—	—	17	—	—	—	—	2-	4-
3	—	—	—	—	2	6	5	7	20	42
4	8	6	5	21	2	6	3	9	28	42
5	3	5	2	21	—	—	—	—	2-	4-
6	5	6	2	21	2	6	8	9	23	48
7	3	5	2	21	2	—	—	7	2-	4-
8	8	6	2	—	—	—	—	—	—	—
9	5	5	2	21	—	—	—	—	—	—
10	—	—	—	—	—	6	—	—	2-	4-
11	8	6	2	21	2	6	5	7	2-	4-
12	3	6	2	21	2	6	—	—	26	42
13	—	—	2	—	—	—	6	7	-8	4-
14	8	6	5	—	2	6	5	9	26	42
15	8	3	2	21	—	—	—	—	4	—
16	—	7	—	11	—	—	5	9	2-	4-
17	8	6	2	24	2	6	5	7	26	42
18	—	—	—	—	—	6	5	—	2-	4-
19	3	5	2	21	—	—	—	—	—	4-
20	8	6	5	71	2	6	5	9	26	42
21	—	—	2	21	—	6	—	—	2-	4-
22	3	2	2	21	—	8	8	9	28	4-
23	8	6	2	21	—	—	—	—	—	—
24	—	—	5	—	2	6	5	9	25	42
25	—	—	—	—	2	6	—	—	2-	4-
26	3	5	2	21	—	—	—	—	2-	4-
27	3	5	—	21	2	—	5	9	26	42

cases, another 53, another 47, and so on. We believe our sample population

³ The tests and follow-ups were all made by Homer Craig, Jr., in the spring and early summer of 1929.

vass revealed a total of 27 well-marked cases who were actually doing the selling of colored materials. In order to be numbered among the color-blind of this group an individual had to fail

on two or more of the plates. This is the same criterion which had been used in a former study (2). The percentage of our salesmen group found to have noteworthy color defect is 7.2, while the former study of 1286 Stanford men examined individually in the

above the responses of the color-blind men. The latter are designated by numbers from 1 to 27. In the response columns a dash indicates complete failure to see the number on that particular plate. Apparently no man of the 27 was completely color-blind, but

TABLE 2
Responses of color-blind salesmen on the various Ishihara plates
Total number of salesmen examined 375; color-blind 27; per cent 7.2

PLATE NUMBER	NORMALS READ	USUAL COLOR-BLIND READ	READ CORRECTLY		READ AS USUAL FOR COLOR-BLIND ¹		MISCELLANEOUS READINGS		UNABLE TO SEE TEST NUMBERS	
			Fre-quency	Per cent	Fre-quency	Per cent	Fre-quency	Per cent	Fre-quency	Per cent
1	12	12	27	100	27	100	0	0	0	0
2	8	3	9	33	7	26	2	7	9	33
3	6	5	9	33	7	26	3	11	8	30
4	5	2	5	19	15	56	0	0	7	26
5	74	21	0	0	15	56	4	15	8	30
6	2	—	12	44	14	52	1	4	14	52
7	6	—	13	48	12	44	2	7	12	44
8	5	—	10	37	13	48	4	15	13	48
9	7	—	6	22	13	48	8 ²	30	13	48
10	—	(5)								
11	—	(2)								
12	26	2 or 6	5	19	2-21	78	6 ³	22	4	15
					6-5	19				
13	42	4 or 2	9	33	4-23	85	1 ⁴	4	4	15
					2-9	33				

¹ Number of readings that correspond to the third column from the left.

² These 8 read the plate as 9, which is easily mistaken from 7.

³ There were 2 others who read it as a single number not 2 or 6; 10 read it as 2 only; 0 read it as 6 only.

⁴ There were 0 others who read it as a single number not 4 or 2; 13 read it as 4 only; 0 read it as 2 only.

At a distance of 10 feet, 6 men showed more accurate readings; 10 showed no improvement; 10 showed less accurate readings (1 was not recorded).

same manner had revealed 106 cases, that is, 8.2 per cent.

The individual results for the salesmen who were found to be color-blind are presented in table 1, which gives their responses on each of the thirteen Ishihara plates. The normal readings for the plates are given in parenthesis

Subjects 2, 8, 9, 15, 19, and 23 certainly gave evidence of very grave color defect. On the results from plates 12 and 13 it seems that Subjects 8, 9, 15, and 23 should be classified as completely red-green blind. Cases that read only the number 2 on plate 12 and only 4 on plate 13 are said to

be green-blind, a condition strongly predominating in our group. Plate 5 is certainly the most sensitive indicator of color weakness that we possess. Nobody in the color-blind group read it in the "normal" way, i.e., as 74. The great majority called it 21, which it usually is to the color-weak or color-blind. It should be said that we found six other salesmen, in addition to the 27, who failed on this plate, one of these read it as 24, but the other five said "21." These men do not have quite normal color vision but as they made no other mistakes we did not count them color-blind.

In table 2 the results on the different plates are grouped and percentages are shown. Normal and color-blind read the first plate correctly, giving the response "12." But plate 2, which has a green background and is read by normals as "8," is ordinarily seen by color-blind as "3," because they do not see a certain section of dots which completes the 3 into 8. The table shows that 9 of the 27 color-blind, 33 per cent, read it correctly, (i.e., they saw the 8) 7, or 26 per cent, read it as "3," 2 gave some miscellaneous readings, and 9, one-third of the group, were unable to see any numeral on the plate. Plate 3 gave similar results. Five of the 27 color-blind correctly read plate 4, 15 read it in the characteristic manner of the color-blind, that is as "2," there were no miscellaneous responses, and 7 men were unable to see a number on the plate. Plate 5 also has a double interpretation. It is read normally as 74, but by the color-blind usually as 21. Fifteen gave the characteristic response of 21, 4 gave miscellaneous responses and 8 were

unable to see any number. Plates 6 and 7 each have one red number on a green field, while 8 and 9 have green numbers on backgrounds made of red-colored dots. There are no hidden numbers on these four plates and hence the color-blind very frequently fail to see anything on them. For these plates we therefore repeat in the column, "Read as is usual for color-blind," the values given in the final column under the caption, "Unable to see numbers." We note here that practically 50 per cent of the group declare themselves wholly unable to see any numeral on these four plates.

The best comparison material we can provide for these results on the salesmen is available in the data secured in three consecutive years on entering men at Stanford University examined under similar conditions with the same test material. These results are given in table 3, parts I, II, and III. Parts I and II represent a tabulation for two years separately of 106 cases of color-blindness found in a survey of 1286 Stanford men and reported in one group in a former article (2). Part III is a tabulation of similar data not previously reported. Part I gives the data for 1927. The number of men examined was 590; number of color-blind located, 48; per cent, 8.1; part II is for 1928; number examined, 696; color-blind, 58; per cent, 8.3; part III reports 1929; number examined, 554; color-blind, 49; per cent, 8.8. Table 3 (students) is arranged in exactly the same manner as table 1 (salesmen), and in general the two tables show agreement. But we must make a close analysis to discover if possible any differences between color-blind sales-

men and color-blind university students. Our best opportunities for comparison are in the percentage columns. For example, in the column headed, "Read as is usual for color-blind," we note that for plates 2 to 9 inclusive the percentages range from

26 to 56 for salesmen while in the comparable sections of table 3 the percentages for the students range from 40 to 85. Again it is noteworthy that a relatively large percentage of the salesmen read plates 6, 7, 8, and 9 correctly. In order to simplify the

TABLE 3
Responses of color-blind university men on the various Ishihara plates

PLATE NUMBER	NORMALS READ	USUAL COLOR- BLIND READ	READ CORRECTLY		READ AS USUAL FOR COLOR-BLIND ¹		MISCELLANEOUS READINGS		UNABLE TO SEE TEST NUMBERS	
			Fre- quency	Per cent	Fre- quency	Per cent	Fre- quency	Per cent	Fre- quency	Per cent
Part I, 1927, number examined 590; color-blind 48; per cent 8.1										
1	12	12	48	100	48	100	0	0	0	0
2	8	3	21	44	19	40	6	13	2	4
3	6	5	20	42	23	48	4	8	1	2
4	5	2	8	17	36	75	2	4	2	4
5	74	21	6	13	35	73	3	6	4	8
6	2	—	4	8	32	67	12 ²	25	32	67
7	6	—	10	21	35	73	3	6	35	73
8	5	—	0	0	38	79	10	21	38	79
9	7	—	2	4	40	83	6 ³	13	40	83
10	—	(5)								
11	—	(2)								
12	26	2 or 6	9	19	2-36 6-12	75 25	8 ⁴	17	9	19
13	42	4 or 2	14	29	4-35 2-17	73 35	3 ⁵	6	9	19
Part II, 1928, number examined 696; color-blind 58; per cent 8.3										
1	12	12	58	100	58	100	0	0	0	0
2	8	3	34	59	20	35	3	5	1	2
3	6	5	21	36	29	50	8	14	0	0
4	5	2	2	3	54	93	2	3	0	0
5	74	21	1	2	48	83	7	12	2	3
6	2	—	10	17	39	67	9 ⁶	16	39	67
7	6	—	12	21	39	67	7	12	39	67
8	5	—	3	5	49	85	6	10	49	85
9	7	—	5	9	46	79	7 ⁷	12	46	79
10	—	(5)								
11	—	(2)								
12	26	2 or 6	5	9	2-41 6-11	71 19	7 ⁸	12	4	7
13	42	4 or 2	10	17	4-41 2-20	71 34	2 ⁹	3	4	7

TABLE 3—*Concluded*

PLATE NUMBER	NORMALS READ	USUAL COLOR- BLIND READ	READ CORRECTLY		READ AS USUAL FOR COLOR-BLIND ¹		MISCELLANEOUS READINGS		UNABLE TO SEE TEST NUMBERS.	
			Fre- quency	Per cent	Fre- quency	Per cent	Fre- quency	Per cent	Fre- quency	Per cent
Part III, 1929, number examined 554; color-blind 49; per cent 8.8										
1	12	12	49	100	49	100	0	0	0	0
2	8	3	21	43	22	45	5	10	1	2
3	6	5	18	37	29	59	2	4	0	0
4	5	2	2	4	41	84	4	8	2	4
5	74	21	0	0	41	84	3	6	5	10
6	2	—	13	27	26	53	10 ¹⁰	20	26	53
7	6	—	18	37	25	51	6	12	25	51
8	5	—	8	16	32	65	9	18	32	65
9	7	—	12	25	33	67	4	8	33	67
10	—	(5)								
11	—	(2)								
12	26	2 or 6	6	12	2-37 6-7	76 14	14 ¹²	29	10	20
13	42	4 or 2	14	29	4-36 2-17	74 35	4 ¹³	8	8	16

¹ Number of readings that correspond to the third column from the left.

² Of these, 9 read the plate as 8, which is fairly easy to confuse with 2.

³ Of these, 5 read the plate as 9, which is easily mistaken from 7.

⁴ There were 0 others who read it as a single number not 2 or 6; 19 read it as 2 only; 3 read it as 6 only.

⁵ There were 2 others who read it as a single number not 4 or 2; 18 read it as 4 only; 3 read it as 2 only.

⁶ Of these, 6 read the plate as 8.

⁷ Of these, 6 read the plate as 9.

⁸ There were 7 others who read it as a single number not 2 or 6; 29 read it as 2 only; 6 read it as 6 only.

⁹ There was 1 other who read it as a single number not 4 or 2; 31 read it as 4 only; 9 read it as 2 only.

¹⁰ Of these, 5 read the plate as 8.

¹¹ Of these, 3 read the plate as 9.

¹² There was 1 other who read it as a single number not 2 or 6; 17 read it as 2 only; 1 read it as 6 only.

¹³ There was 1 other who read it as a single number not 4 or 2; 19 read it as 4 only; 3 read it as 2 only.

comparisons we have derived the two short tables 4 and 5. In table 4 we have grouped the results for plates 2, 3, 6, and 7 in all of which red numbers are presented on green backgrounds. Under the captions, "Read correctly," "Read as is usual for color-blind," and

"Unable to see numbers" we have taken the percentages directly from table 2 for the salesmen and have averaged the per cents found in the three parts of table 3 for the students. It will be seen in table 4 that salesmen do much more poorly than students with plates

2 and 3; fewer of them read the test numbers correctly (as normal people read them), fewer show the typical color-blind result, and many more (10 times as many) fail to make out any numbers at all. Table 5 shows practically the same state of affairs for plates 4 and 5 with a single exception: 19 per cent of the salesmen read plate

diction between the two groups and we sought some difference in type of color-blindness that might account for it. Turning to plates 12 and 13, which possess the unique advantage of classifying subjects as red-blind or green-blind, we found very substantial agreement between the two groups. Salesmen and students both show a

TABLE 4

Comparison of color-blind salesmen and color-blind university students in their reading of red numbers on green backgrounds (values in per cent)

RESPONSES	ISHIHARA CHART NUMBERS							
	2		3		6		7	
	Salesmen	Students	Salesmen	Students	Salesmen	Students	Salesmen	Students
Read correctly.....	33	49	33	38	44	17	48	26
Read as is usual for color-blind.....	26	40	26	52	(52)	(62)	(44)	(64)
Unable to see number.....	33	3	30	1	52	62	44	64

TABLE 5

Comparison of color-blind salesmen and color-blind university men in their reading of green numerals on red backgrounds (values in per cent)

RESPONSES	ISHIHARA CHART NUMBERS							
	4		5		8		9	
	Salesmen	Students	Salesmen	Students	Salesmen	Students	Salesmen	Students
Read correctly.....	19	8	0	5	37	7	22	13
Read as is usual for color-blind.....	56	84	56	80	(48)	(76)	(48)	(76)
Unable to see numbers.....	26	3	30	7	48	76	48	76

4 correctly as compared to 8 per cent of students. When we consider plates 6 and 7 in table 4, and 8 and 9 in table 5, we find our comparisons just reversed. Here more color-blind salesmen than students (twice or three times as many) read the plates correctly and decidedly fewer salesmen fail entirely to see the test numbers. At first sight this seems a direct contra-

strong predominance of green blindness, in the ratio of 3 cases to 1 of red blindness. The contrast in results for the other plates appears now to rest on two considerations. Plates 2 to 5 inclusive all contain hidden numbers and each numeral is made up or interwoven with more than one color. This complication makes these charts difficult material even for those with normal

vision. It is relatively easy even for individuals without defect to see the centers of these four charts as complicated color blurs, whereas in plates 6 to 9 inclusive the numerals are in one color only and therefore fairly clear. The older men (salesmen) were bothered more by the complicated figures, while with the simpler plates their longer experience and perhaps more persistent attention to colors enabled them to do somewhat better than the students.⁴

If we consider the average incidence of color-blindness in university men to be about 8.4 per cent, the salesmen with their incidence of 7.2 per cent in the population examined are demonstrating a frequency which equals only 86 per cent of that found in the younger group. Had we found 31 cases in place of 27 our salesmen's results would have been just at the average level of incidence. Perhaps it is not impossible that in a group of 375 men 3 or 4 severe cases of color-blindness have been eliminated from the industry by the process of natural selection, but we cannot be certain of this at present. The difference, 1.2 per cent (i.e., 8.4 minus 7.2) is not a statistically reliable difference with groups of the size reported. The standard deviation of this difference is 1.49, and the difference is therefore only 0.81 times its S.D. With groups of the size of ours the difference would have to be at least 4.5 per cent to qualify as of probable statistical significance according to the usual criterion in such measurements. The differences recently published by Clement (3) in a

comparison of races with respect to color-blindness seem to satisfy the statistical criterion of validity. The variations between the three subgroups of table 3 cover a total range of 0.7 per cent, which is about one-half the size of the difference between salesmen and students. We have therefore just a slight hint and no more that color-blindness in dry-goods salesmen may be a little less than in the general population. Examination of additional cases should indicate whether or not the smaller percentage value found in our particular group of salesmen is typical of their occupational class.

DISCUSSION

Our testing of 375 dry-goods salesmen indicates that this occupation does not on the one hand draw to itself color-blind individuals nor does it rid itself particularly of the color-blind men whom it chances to draw. There were six of the color-blind salesmen who, although unable to read the numbers, could nevertheless give the color of any dots to which the examiner pointed. In other words, they had no trouble whatsoever with solid colors. Four of the men improved their readings at the ten-foot distance, indicating that they have greater color sensitivity at the center of the fovea, an equipment which is, of course, sufficient for most ordinary uses.

There was no instance found where salesmen had obviously benefited by being color-blind, or where color-blindness was consciously being used as an asset to the individual or the occupation. One man who had very definite red-green blindness was still able to

⁴ It may be that color-blindness changes somewhat with age. We do not know of any other results on this point.

make excellent color combinations and had formerly been a "color expert," to use his own words. He claimed to have acquired color-blindness and so no longer to be able to detect color mixtures which he had formerly recognized. Of the entire list of subjects, 15 cases of the more pronounced type, men who were constantly selling colored goods and either failed to tell color mixtures or color solids with any degree of accuracy, were selected for examination as to occupational performance. From a survey of their activities it seems evident that as a group they were a liability in their present placements to the firms represented. Undoubtedly they should have been used in some other departments or lines. On careful examination it was found that each of these men made frequent mistakes such as would cause embarrassment to customers and to the firm, and serious errors unless some other salesman was called upon to assist in difficult combinations or sales. Many of these men found it necessary to place various colored pieces of goods on definite shelves so that when customers called for a certain color they would know where to find it, in terms of space rather than by direct visual perception. In one case it was found that the color-blind salesman's returned goods aggregated a much larger amount than was recorded for any other man in that department. The store explained the fact by saying that this salesman was known as a "forcer of sales." The average salesman endeavors to give just the right word that will make the customer think the object in question well suited to the need. The color-

blind salesman cannot always render the wise verdict that should clinch a sale. He must resort to some special phrases such as, "Now I suggest that you take this home and see it under the conditions of lighting that you have. Then you will be able finally to decide. If it isn't all right of course you can bring it back." In such a case the customer may himself be a bit doubtful, but goes away with the materials and, unfortunately, in a large number of cases, returns them later. Our explanation here is of course based to a considerable extent on speculation. It was impossible to follow up cases in terms of store records sufficiently well classified to give clear quantitative evidence on this point.

The silk counter seems to have its own way of scaring off color-blind salesmen, but no other color-dispensing counter or department is immune from them. To the actual defect is added the fact that color-blind salesmen are usually not fully aware of their own difficulties, do not often know how to avoid errors on this account, and, furthermore, their associates, who of course do not understand, criticize readily and unfairly.

As a result of our investigation it seems safe to say that one-half of the color-blind individuals who are attempting to sell color are something of a detriment to their respective firms. In the interests of business efficiency and of personal accomplishment these people should be transferred to other departments. The Ishihara Test is such a convenient tool for sorting people in this regard that there is every reason to recommend it strongly for use in personnel departments of mer-

cantile establishments. The employment manager or whoever holds the original interview with the applicant might have Ishihara plate 5 on his desk. This would indicate sufficiently in just a moment's time whether the individual is normal in color vision.⁵ If he does not succeed in this simple test it is quite probable that he is color-blind. Further tests should be made in such cases. If the color-weak or color-blind condition is found when the man is first employed, perfect occupational adjustment so far as this point is concerned can be readily achieved in most industries.

Our original question as to possible special values of color-blindness in industry is still unanswered. We discovered one man who had perfectly normal color sense in one eye and marked color-blindness in the other. He knew the state of affairs and used his eyes accordingly. This would be an ideal combination if the notion that brightness matching can be done best by the color-blind is sound. Managers who find themselves blessed with one or two color-blind salesmen of superior intelligence might experiment in this field, proceeding with the full recognition of the situation and depending

on the combined effort of the color-blind salesman or "expert," the customer, and the associate salesman of normal vision. It seems likely that the careful color-blind eye has a contribution to make if we knew just when and how to use it.

SUMMARY

1. Color-blindness is almost if not quite as common among dry-goods salesmen as in the general population of young men. From testing 375 clerks individually it was found that 7.2 per cent clearly showed this defect.

2. All departments and counters dispensing colored fabrics, with the possible exception of silks, were represented by color-blind salesmen many of whom must constitute unknown but probably serious liabilities to their employers.

3. No cases were discovered where color-blindness was being consciously used as an asset in the occupation, but it is suggested that in certain cases trials might be made to find out if such possibilities exist.

4. Regular use of the Ishihara Test at the time of employing men in mercantile establishments is recommended. Ishihara plate 5 only need be used at the original interview. Those found to have color defect should not be placed where this lack will frequently cause confusion or embarrassment to customers or to themselves.

⁵ The applicant could of course be coached to say "74." But if the examiner has doubts he may easily make further requests such as: "Point to the dot on the extreme left of the 7," "What dots are inclosed by the 4," etc.

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Achievement in College and in Later Life

BY T. A. LANGLEIE AND ASHTON ELDREDGE, *Wesleyan University*

Achievement of college men after graduation is in some degree predictable from their college scholarship and also from their prominence in student activities. Among Wesleyan alumni, scholarship is the better index.

This study was undertaken to determine the relation between scholastic or extra-curricular achievement and vocational success of Wesleyan University alumni. The three highest and the three lowest ranking men in scholarship and in activities of the twenty classes, 1897-1916, were selected. Ratings of their vocational achievements were obtained from twenty-five of their classmates. These ratings then were compared with their achievements while undergraduates and the following conclusions drawn:

1. Scholastic and extra-curricular achievement are not related to a marked extent, though good scholars do achieve more along other lines, on the average, than poor scholars.
2. The most successful group, according to ratings, is the high scholarship group, followed by the high extra-curricular achievement group.
3. The least successful group is the low extra-curricular achievement group.
4. Differences in scholastic achievement or in extra-curricular achievement are correlated to a marked extent with vocational achievement. The subjects studied were extreme cases, however, so the above conclusions must be interpreted accordingly.

INTRODUCTION

THERE has been much discussion in recent years about the relationship between college achievement and later success. One of the most comprehensive studies of this problem has been reported by the American Telephone and Telegraph Company,¹ showing that scholastic success in college is related posi-

tively to business success as measured by salaries obtained with that company. They also revealed a similar but less positive relationship between extra-curricular achievement and business success.

The answer to this question of relationship between college and business success is important for prospective employers, for college students and faculties, and for society in general, since it may emphasize the importance of our colleges for later life, or it may illustrate the invariability of individual achievement from

¹ W. S. Gifford, Does Business Want Scholars? *Harpers Magazine*, May 1928.

Donald A. Bridgman, Success in College and Business, *PERSONNEL JOURNAL*, June 1930, vol. ix, no. 1.

youth to middle age. If a true relationship is found to exist we are faced with further problems of interpretation and selection of causal factors. We may conclude that success in business is due to college training or we may conclude that success in business and in college is due to the capacities, interests, and character of the individual. The writer favors the latter interpretation and thereby emphasizes the need for early development of interests, character, habits of work, and objective self analysis to determine lines of future endeavor. Such a deterministic point of view obviously has wide social, educational, and vocational implications. But before any further discussion of interpretation takes place it is necessary to determine more definitely what relationship does exist between college and business achievement.

This study is the third of its kind to be conducted with Wesleyan alumni as subjects. Nicolson,² in 1915, studied the relationship between scholastic success and inclusion in *Who's Who*, reporting positive results. Landis and Thornhill,³ in 1928, compared extra-curricular achievement in college with inclusion in *Who's Who*, with negative results. The present study compares both scholastic achievement and extra-curricular activities with later success, not as determined by inclusion in *Who's Who*, but as rated by other Wesleyan alumni.

² F. W. Nicolson, *Success in College and in After Life. School and Society*, August 15, 1915.

³ R. E. Thornhill and Carney Landis, *Extra-Curricular Activity and Success. School and Society*, July 28, 1928.

METHOD

Members of the graduating classes of 1897 to 1916 inclusive were divided into four groups to correspond with their achievements in college. These groups were composed of: (1) the three men in each class with highest scholastic averages; (2) the three men in each class with lowest scholastic averages; (3) the three men in each class who had been most active in extra-curricular work; and (4) the three men in each class who had been least active in extra-curricular work. Scholarship was determined by inspection of the college office records and extra-curricular achievement by records found in the college year books for these classes.

This list of 240 names was then submitted to the twenty class secretaries representing the twenty classes and to five other alumni who were chosen because of their familiarity with the graduates of the college. These judges were requested to rate each man according to his success, which was defined as "relative degree of achievement in the field in which the individual was engaged." Four classifications were requested from each rater, namely: 1. successful; 2. average; 3. unsuccessful; and 4. unknown. Ratings were obtained for almost all of the subjects from at least one judge, and in most cases from seven to ten judges. This study compares these ratings of vocational achievement with indices of scholastic and extra-curricular success.

RESULTS

Table 1 presents the number of subjects in each category with the mean

and probable error of each distribution of measures.

Scholarship is represented by numbers ranging from 1 to 6, 1 being the highest grade and 6 being the lowest. Extra-curricular activities (E.C.A.) is represented by arbitrary weights from 1 to 10 which were assigned to each kind of activity and totalled.

Obviously, the different groups are

with respect to their scholarship. Table 2 presents the results of this analysis.

According to these figures it appears that selecting two groups on the basis of extra-curricular achievements does not result in having groups who differ in scholastic averages, but when they are selected according to their scholarship they are also selected somewhat

TABLE 1
Measures of central tendency and variability of the groups

GROUP	N	MEAN	P.E.	RANGE
High scholarship.....	57	1.28	.13	1.00- 1.99
Low scholarship.....	57	3.66	.06	3.10- 4.70
High E.C.A.....	60	91.77	15.10	48.00-149.00
Low E.C.A.....	57	1.49	.73	.00- 3.00

TABLE 2
Measures of central tendency and variability of the groups in scholarship and activities

GROUP	N	MEAN	MEDIAN	PROBABLE ERROR	SEMI-INTER- QUARTILE RANGE
Scholarship index					
High E.C.A.....	60	2.61	2.76	.55	.70
Low E.C.A.....	57	2.67	2.70	.49	.48
Activities index					
High scholarship.....	57	26.98	21.77	24.07	9.74
Low scholarship.....	57	29.23	13.50	21.17	21.58

quite distinct from each other in terms of scholarship on the one hand, and activities on the other. There is no overlapping.

These groups were next studied to determine whether our methods of selection had influenced each group in other respects. The two scholarship groups were compared according to their extra-curricular achievements and the E.C.A. groups were compared

according to their activities. The distributions of activities indices are markedly skewed as shown by the differences between means and medians, and the low scholarship group is scattered over the activities scale to a considerably greater extent than is the high scholarship group. Furthermore, the good scholars participated in activities to a greater extent, on the average, than the poor scholars. It

seems probable that some of the poor scholars were in that category because of too much participation in activities. Nevertheless, the two scholarship groups are much more discreet in scholarship than in activities indices.

The opposing groups were finally compared according to their vocational success or failure. The ratings that were obtained were given numerical values in order to average and compare

High E.C.A. group next. The "low" groups are almost equal, with a slight margin in favor of the Low Scholarship group. The "high" groups scatter more than the "low," but more than 75 per cent of the good scholars were rated as "average" or better. The most active men were rated in a similar manner, but with more "average" instead of "successful" ratings.

There is very little overlapping in

TABLE 3

Medians, quartiles, semi-interquartile ranges, and measures of skewness of the groups in rated vocational success

GROUP	N	MEDIAN	Q ₃	Q ₁	S.I.Q.	$\frac{Q_3 - Md}{Md - Q_1}$
High scholarship.....	57	4.35	4.91	3.08	.92	.442
Low scholarship.....	57	2.91	3.05	2.04	.51	.165
High E.C.A.....	60	3.56	4.70	2.96	.87	1.912
Low E.C.A.....	57	2.33	3.03	1.51	.76	.843

TABLE 4

Per cent of each group which equals or exceeds median scores of the other groups

	HIGH SCHOLARSHIP	LOW SCHOLARSHIP	HIGH E.C.A.	LOW E.C.A.
High scholarship.....	—	89.5	69.4	97.1
Low scholarship.....	5.3	—	12.5	68.7
High E.C.A.....	27.9	83.3	—	96.4
Low E.C.A.....	8.3	42.1	15.3	—

different ratings. A rating of "successful" was given a value of 5; a rating of "average" was weighted 3; and "unsuccessful" was valued at 1. Table 3 presents measures of central tendency and variability of these ratings for the various groups.

Medians are used to represent central tendency because all of the distributions are markedly skewed. The High Scholarship group is easily the most "successful" group with the

these distributions. 89.5 per cent of the good scholars equal or exceed the median poor scholar, and 97 per cent of them equal or exceed the median inactive man. The median inactive man is exceeded by 96.4 per cent of the active men, and 83.3 per cent of the latter equal or exceed the median poor scholar. These and other measures of overlapping are presented in table 4.

The figures presented are definite

evidence that the groups of Wesleyan alumni, as selected for the purposes of this study, do tend to succeed in their chosen vocations according as they have succeeded in college, whether in scholarship or extra-curricular activi-

ties. The subjects selected are, of course, extremes, and the relationship is not perfect, but the differences in rated vocational success are sufficiently marked to warrant our conclusion.

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The Development of Personality at the College-Adult Level

BY R. A. BROTEMARKLE, *University of Pennsylvania*

From a background of rich experience in counseling college students, Dr. Brotemarkle has listed and classified the agencies operative in developing personality at the college-adult level, and related these to their functional aims.

The terms "character" and "personality" are defined and illustrated. A comprehensive analysis is made of the factors involved in college-adult personality development. The general functional aim of each factor or group of factors is presented with the hope of shedding light on the construction of programs and methods of personality development in college.

ON MY Office desk, directly before the eyes and hands of all who sit opposite me to discuss their problems, lies a pair of brass knuckles. They have become a part of my individuality in the Office—and a veritable part of my personality in human contacts with students and faculty. They are the most effective "contact" or rapport materials I have ever employed. An agitated mind and nervous hands eagerly grasp them; but, after a few seconds of toying with them, a few remarks about or around them—an object largely unknown to most visitors—an easy going course of conversation is immediately leading into the open-hearted, frank discussion of the problem at hand. But to me these brass knuckles mean much more.

First, having been surrendered in confidence by a prisoner several years

ago, while undergoing an examination for a court, they are a constant reminder of the necessary frankness of all concerned in the solution and direction of personality problems of individual and social adjustment.

Second, they are a constant reminder of the relation of personality development to college education. It happened as follows. One more visitor is seated before the "brass knuckles." I am disturbed momentarily—for surely he has come to complain of some misconduct of one of our students. He is a taxi driver—rather rough looking in his dirty sheep-skin vest. Not catching his name quickly, I was intent on noting the number on his slouchy cap. "Well," says he, "if that's your game, I'll stick." And with some dexterity he reaches to a hip pocket and lays a "brass knuckle" beside the one on the desk. A crowded drawer of

loose papers had necessitated one of the "knucks" being used as a paper weight. But it was my game and placing the other "knuck" on the desk I "raised the ante." Whereupon my caller, reaching into his other hip pocket, laid down his other "knuck" with "Well, I'll stick with you; what's the toss." My visitor was none other than one of our students whom I had summoned to a conference. He had been delayed by his part-time employment. Briefly this is the story. Here was a boy working in the mines; an interested friend inspires him to obtain an education, and gives him enough financial support to allow him to attend college classes, and spend the hours necessary for social development in part-time employment to keep body and soul together; and now he is a man, with a diploma stating that he has satisfactorily passed certain college courses and has a bachelor's degree, but without the personality to use the education he has attained, working in the same mines from which he had taken a vacation "to go through high school and college."

My "brass knuckles" afford me a direct rapport in my many student contacts, and ever keep in my mind the basic relationship between education and personality, the development of a personality which can employ an education in the social order of our day. And this is the beginning and the end of the development of personality at the college-adult level—if not all education.

The curricula content of college courses and the instruction in the classroom we must leave to the Faculty;

ours is the task of relating the product of collegiate education to personality. This is the greatest engineering task of human kind, the construction and employment of human character in an integrated personality. Dr. Lightner Witmer, Director of the Psychological Clinic at the University of Pennsylvania, has given us a new term; he has recently called such work "personengineering." In his analysis of the problem of human conduct he has emphasized the "corrective," "preventative," "directive" and "creative" phases in the "production of the preferred patterns of human behavior" or personality.

Words like "character" and "personality" have been too loosely bandied about of late; we must emphasize some scientific foundation of their meaning. The human individual begins life as a "human organism," passes through a genetic development of "congenital potentialities" and acquired "conduct habituations," constantly presenting to all other individuals, as to himself, the momentary product of an organized system of character traits, integrated in a functioning personality. The general integrated reactions of his life mark him off from the animals and things about him as a "human personality;" his "individual responses" mark him off from other humans as a discrete "individual."

The college entrant arrives on the campus a product of the character education and personality development through which he has passed in approximately seventeen or eighteen years of activity in a home and a series of schools, amidst the myriad influences of our present day complex social order and numerous community agen-

cies. What we mean by his character is our estimate or general rating of his tendencies, habits and attitudes occurring in an oft-repeated form of conduct in any specific phase of performance. These character traits may easily be subsumed under four general headings. We will observe certain physical traits which are clearly indicated in the "skills" which he has attained in the use of the body in the performance of his daily tasks. He is vivacious and exercises a high degree of coördinated control over his physical activities. We will observe certain characteristic traits of intellect or mental response to the many stimuli about him. He is observing and quick to understand the relationships of intelligent ideas. We will observe certain Temperament traits or firmly fixed emotional responses to the situations in which he finds himself. He is cheerful or despondent, frivolous or zealous, cowardly or courageous. We will observe certain character traits of moral response to the problems involved in his social contacts. He is friendly, loyal, and compassionate, or sullen, antagonistic and supercilious.

And he is all of these things because of his nature and the character education through which he has passed. Character education is the training of the individual in the quality and degree of the various complex character traits. It aims to consolidate the reaction attitudes into a definite "set" or attitude of character.

And as for his personality—have we not been discussing already its very foundations? Personality is our estimate or general rating of the individual in his entire performance. It denotes

the quality and degree of his development taken as a whole. In life, and even in the experimental situations of the psychological laboratory, we are faced with the fact that we cannot observe the individual personality functioning solely in physical, mental, emotional or social units—but always as an integrated whole. Our analysis of details of specific character traits in certain phases of human performance are meaningless until related to the synthetic function of an integrated personality.

And the individual is all of this because of the development through which his personality has passed. Personality development is the growth of the individual in the quality and degree of various personality traits. It aims to permit the integrated reaction "set" or attitude to express itself through the individuality of the person.

We should consider personality then as the sum total of all the biological innate dispositions, impulses, tendencies, appetites and instincts, and all of the acquired dispositions and tendencies in an integration of character.

Our program and methods of personality development will necessarily be determined by the specific problem at hand. We will find it necessary to adapt ourselves to varying points-of-view—as to whether we are correcting defects or developing capacities, laying down a preventative background to insure against deviation from the presently accepted patterns of preferred performance, or encouraging the unfolding of an individually created perfection of superior activity.

The myriad activities of personality development in colleges have long been

a subject of heated discussion, only lately of more scientific investigation. The trend of this investigation has recently been indicated by a "Bibliography on Methods for Personal Development of College Students" by Grace E. Manson, in the Educational Record, Supplement, No. 9, January, 1930, of the American Council on Education. Of the 275 items 75 were chosen for annotation because of their "recency" and "pertinency." A survey of the latter will show the emphasis in recent investigations in the field. Forty-five of the 75 manuscripts referred to are bibliographies, programs, surveys, summaries of the present trends, theory or the combination of these approaches. The 30 manuscripts which report scientific investigations are based largely on concrete experimental methods, only 8 being carried on under the questionnaire method. They reveal that a definite emphasis is being placed on the "study" problem. Ten articles refer to "how to study" or other study problems. The other ex-

perimental articles investigated the following factors: Honesty 4, Instruction 2, Character and Personality 2, Faculty 2, Personnel 1, and Mental Hygiene 1.

An intimate knowledge of the literature would reveal that there has been too great an emphasis on the programs and methods of personality development of college students without a very thorough analysis of the numerous factors involved or an understanding of the functional process of these complex factors. It is my purpose to attempt such an analysis at this point.

FACTORS IN DEVELOPMENT OF PERSONALITY OF THE COLLEGE-ADULT

The development of personality at the college-adult level is secured by five specific contacts. The first and last of these might readily be said to be outside of the immediate contacts of the age level which we are discussing, but are, none the less, an integral part of the entire process.

<u>Original Contacts</u> (Antecedent Period)	<u>Selective Process</u>	<u>Orientation Process</u>	<u>Collegiate Process</u>	<u>Alumni Contacts</u> (Subsequent Period)
<i>Factors in the original contacts</i>				
Individuals	—Parent			
	—Alumni			
	—Relative			
	—Friends			
	—Teachers			
Groups	—Local Alumni Clubs			
	—General Alumni Association			
Activities —Athletic	—Penn Relays			
	—Tournaments			
—Campus	—School-Boy Day			
	—School Visitation			

Factors in the selective process

- | | |
|---------------------------------------|---------------------------|
| Admission Requirements — Intellectual | — Class standing |
| | — Examinations |
| — Mental | — Scholastic Aptitude |
| | — Examination |
| — Physical | — Health certificate |
| | — Vaccination certificate |
| — Character | — Certificates |
| — Personality | — Ratings |

Factors in the orientation process

- | | | |
|---------------|-----------------|----------------------------------|
| FRESHMAN WEEK | —Administrative | —Registration |
| | | —Payments |
| | | —Class admission cards |
| | —Academic | —Educational |
| | | —Advising |
| | | —Regulations |
| | | —How to Study |
| | | —Study Habit Rosters |
| | | —Vocational |
| | | —Pre-professional |
| | | —Informative |
| | —Inspirational | —Responsibilities |
| | | —Customs and Traditions |
| | | —Vigilance Committee |
| | | —Opening Exercises |
| | —Social | —Class get-together |
| | | —Smokers |
| | | —Luncheons |
| | | —YMCA & YWCA Camp |
| | | —Church Activities |
| | | —Religious Group Activities |
| | —Informative | —Catalogues |
| | | —Student Hand Book |
| | | —Activities |
| | | —Athletics |
| | | —Library |
| | | —Publications |
| | | —Musical |
| | | —Non-athletic |
| | —Personal | —Dormitory counselors |
| | | —Upper-class counselors |
| | | —Faculty advisers and counselors |
| | | —Dean |
| | | —Personnel Officer |

Factors in the collegiate process

<i>Agency</i>	<i>Functional Aim</i>
PHYSICAL— Health—	
Student Physicians	Curative Treatment
University Hospital	Curative and Corrective Treatment
Specific Case Problems	Corrective Treatment

	<i>Agency</i>	<i>Functional Aim</i>
<i>Hygiene—</i>		
Lectures		Preventative Information
Quarantine		Preventative Control
Sanitation		Preventative Control
<i>Physical Education—</i>		
Physical Examination	—Health	Developmental Protective Information
	—Sports	Protective Guidance
Required Exercise and Swimming		Developmental Protective Exercise
Corrective Exercise	—Special	Corrective Exercise
<i>Sports—</i>		
Competitive	—Inter-Collegiate	
	—Major Sports	Competitive Exercise—Sport
	—Minor Sports	Competitive Exercise—Sport
	—Intra-Mural	
	—Inter-Fraternity	Socio-competitive Recreation
	—Inter-Departmental	Socio-competitive Recreation
	—Inter-Class	Inspirational Competitive Recreation
	—Penniman Bowl	Inspirational Competitive Reward
	—Inter-Activity	Socio-competitive Recreation
		Socio-individual Recreation
Unorganized Play—		
<i>Vocational Training—</i>		
In courses	—Laboratory	Informative Vocational Skills
	—Clinics	Informative Vocational Skills
	—Shops	Informative Vocational Skills
Military Training —		Military Preparation—Skills
CURRICULAR—		
<i>Instructional—</i>		
Class-room		Developmental Informative Instruction-Inspiration
Extra-class-room	—Library	Developmental Informative Instruction
	—Museum	Developmental Informative Instruction
	—Lectures	Developmental Informative Instruction
	—Research	Developmental Informative Instruction
<i>Educational Guidance—</i>		
Academic		Directive
Pre-professional		Directive
Vocational		Corrective-Direction
Eligibility		Preventative Control
Personal		Corrective Adjustment
<i>Awards and Honors—</i>		
Prizes		Inspiration—Reward
Privileges	—Unlimited cuts	Incentive —Inspiration
Yearly honors in course		Incentive —Inspiration
Graduation honors		Reward
<i>Probation Systems—</i>		
Academic	—Scholastic Course	Corrective Guidance
	—Conduct	Developmental Adjustment
Welfare	—Conduct	Developmental Adjustment

	<i>Agency</i>	<i>Functional Aim</i>
<i>Honorary Fraternities and Societies—</i>		
Fraternities	—20	Inspiration —Reward
Societies	— 6	Inspiration —Reward
<i>Economic—</i>		
Scholarships		Developmental Aid
Loans		Developmental Adjustment
Self-help	—Employment	Developmental Aid
	—Placement	Developmental Guidance
EXTRA-CURRICULAR—		
<i>Competitive Activities—</i>		
Class activities	—Officers	Socio-political Development
Honorary Societies	—Senior 2	Socio-political Development
	—Junior 1	Socio-political Development
Managerial Offices	—Activities	Socio-executive Development
	—Clubs	Socio-executive Development
	—Publications	Socio-executive Development
	—Sports	Socio-executive Development
Publications—11		Journalistic Development
Student Council	—Government	Socio-political Development
<i>Non-Competitive Activities—</i>		
Fraternities and Sororities		
	—Men 91	Socio-individual Development
	—Women 22	Socio-individual Development
Class Functions	—Dances	Socio-recreation
School Functions	—Smokers	Socio-recreation
	—Luncheons	Socio-recreation
	—Rallies	Socio-inspiration
	—Founder's Day	Socio-inspiration
	—Hey Dey	Inspiration
	—Class Day	Socio-inspiration—Reward
Commencement		Inspiration—Reward
Endowment Campaign		Loyalty—Coöperation
<i>Clubs—</i>		
Departmental	—Chemistry 1	Information
	—History Clubs 2	Information
	—Language Clubs 5	Socio-information-Training
	—Psychology Club 1	Information
Dramatic	—Dramatic Clubs	
	—Women	Recreative-Training
	—Men	Recreative-Training
Literary	—Literary Clubs 2	Socio-informative-Training
Miscellaneous	—Aero Club 1	Information
	—Chess Club 1	Recreation
	—Glee Club	Recreative-Training
Musical	—Men	
	—Women	
	—Orchestra	Recreative-Training
	—Band	Recreative-Training
	—Mask and Wig Club	Recreative-Training
Publications	—Franklin Society	Socio-executive Development
School	—Architecture 1	Information
	—Arts Association 1	Information

<i>Agency</i>	<i>Functional Aim</i>
—Dental 12	Information
—Educational Club	
—Women	Information
—Men	Information
—Engineering Clubs 3	Information
—Fine Arts 1	Information
—Law 9	Information
—Medical 10	Information
—Veterinary 1	Information
—Wharton Association 1	Information
Sectional	Socio-development-Coöperation
Secondary School	Socio-development-Coöperation
<i>Religious Agencies—</i>	
Chapel	Religious Development
Christian Association	Socio-religious Development
—Denominational Pastors 9	Religious Development
Newman Club	Socio-religious Development
—Catholic Rectors 2	Religious Development
Jewish House	Socio-religious Development
—Jewish Rabbi	Religious Development
Churches	
—Designated Campus Churches	Socio-religious Development
<i>Social Service—</i>	
University Settlement House	Socio-development-Training
Church Agencies	
—Young People's Activities	Socio-development-Training
<i>University Centers—</i>	
Bennett Club	—Women
Houston Club	—Men
Houston Hall Store	Social-Recreation-Convenience
Houston Hall Travel Bureau	Convenience
HOUSING AND LIVING—	Executive-Convenience
<i>Residence—</i>	
Dormitories	
—Men 37	Study-Living
—Women 1	
Fraternity & Sorority Dormitories	Study-Living
Supervised Boarding Houses	Study-Living
<i>Meals—</i>	
University Restaurants 2	Sustenance
Fraternities	Sustenance
Boarding Houses	Sustenance
Public Restaurants	Sustenance
<i>Environmental—</i>	
Climatic	Health-Work-Living
Surroundings	Health-Work-Living
City Advantages	
—Theatre	Cultural-Recreation
—Opera	Cultural-Recreation
—Orchestra	Cultural-Recreation

Factors in the Alumni Contacts

- Individuals —Administrative Officers
 - Faculty
 - Class-mates
 - Friends
- Groups —Class Organizations
 - Departmental Organizations
 - General Alumni Association
 - Placement Bureau
- Activities —Athletics
 - Campus Publications
 - Campus and Fraternity Activities and Functions
 - University Fund
 - University Publicity

It is neither necessary nor feasible to enter into a detailed discussion of each factor we have indicated. However, it should be stated that this analysis has been based upon the activities of the University of Pennsylvania in order to make it specific. Such variations as would occur in other institutions might be used to construct a general analysis, if such is advisable. The primary purpose of such an analysis is for the specific use of separate institutions.

FUNCTIONAL AIM OF FACTORS

The functional aim of each factor is stated in a broad general scope and must be considered in light of its integrated function with all other factors at work in the given training or developmental situation.

The functional aim of the original contacts is two-fold. First, the establishing of a motivating interest; and second, the maintenance or furtherance of this interest toward the act of application for admission.

The functional aim of the selective process is at the same time individual and institutional. It purports to select the individual who will profit most in

the collegiate processes of the institution, and whom the institution can depend upon for continuation of its increasing preferred performance in the changing social order.

The general functional aim of the collegiate process is developmental. It divides, under the demands of the individual case problem, into specifically developmental, corrective, preventative, directive or creative (inspirational) phases of "character education."

It is perhaps surprising to many to note that we have placed no measure of weight or emphasis on the single factors in the collegiate process. It is most surprising, I presume, that we have not given the curricular instruction of the class-room or course materials a place of decided preference. It is the specific challenge of human personality to the functioning of the college that individual differences in the "set" or attitudes of character are so variable. Where one individual is mis-informed, another is already as well informed as the class-room course instruction can hope to make him; the challenge to collegiate education is to adapt itself to the developmental

function necessary for the establishment of preferred performance on the part of each individual. This is equally true of physical health, gentlemanly demeanor, social adjustment, leadership, moral judgment or any and all other phases of personality.

The functional aim of the alumni contacts is a continuance of the developmental processes of the collegiate training. It is attained through constant emphasis upon such inspirational factors as will motivate the highest functional use of former training in the daily life of the graduate.

PROGRAM OF PERSONALITY DEVELOPMENT

In light of these myriad complex factors of personality development, what shall be said of our program for its expression? Recent studies in many representative institutions among undergraduates, graduates and faculties alike have revealed the recognition of these many important activities in the development of personality in college education. A. B. Crawford in "Incentives to Study," has revealed the relationship of many of these factors to the problem of study, concluding that, "the primary and natural incentive offered by the course of study above is evidently insufficient." And present evidence would indicate that this is as true of the motivating influences in the highly aristocratic educational structures of English colleges and prevailing democratic educational structures of American colleges, as it is of all variations or modifications of either of these structures.

The recent rapid development of the

personnel system in American colleges has further emphasized the need of a coordinating liaison center of personality development. This system, under various forms, aims to make available to student and faculty alike the best possible means of adjustment for complete coordination of all factors in the development of personality. Recently, however, I have been interested in the judgment of undergraduates, graduates and faculty on the project of the establishment of a new collegiate institution. The results of the Valley Forge Questionnaire of the Committee on Educational Aspects of the Valley Forge Project at the University of Pennsylvania, coming from a typical cross-section of the Undergraduate School Family, is representative. Above all else the demand is for a training which will enable the individual "to analyse and reason clearly," develop "a broad intellectual interest" and "express and communicate one's thoughts clearly." And to secure this, along with all of the necessary educational procedures of the curricula, is the insistent demand for "a well balanced program of intercollegiate and intramural athletics, and a reasonably proportioned distribution of other student activities, such as Journalism, Executive and Managerial, Debating, Dramatic, Music, etc."

Whatever may be said for or against specific programs now in force, the ever increasing demand of all those concerned with the individual, the functioning of the college, or the product of its activity, will be that the program must be modified to carry the development of personality to the highest preferred level of performance in the social

order, and more, modified in light of the changing needs of that social order.

METHODS OF PERSONALITY DEVELOPMENT

Educational methods will apparently remain an eternal conflict between "status quo" and experimentation. The proponent of today's change is the opponent of tomorrow's. The burden of responsibility for proper training constrains even the enthusiast. Educational experiments are either complete failures or successes; and we are hesitant to accept the improved method. Perhaps we need not be greatly concerned about the changes in methods of procedure; what matters most is that the method used shall be definitely impressive and specifically effective.

The end-purpose of personality de-

velopment, by whatever methods we shall employ, is the definite habituating of the individual to the "preferred patterns of performance" in the social order. And the adequacy of our methods will be measured by the individual and social adjustment of personality in the social order; while the motivating force of our method will be measured by its controlling definiteness in life activity.

Four years is a short period indeed in which the college shall continue to apply the many factors of personality development to the leaders of succeeding generations. The basic principle of education, "Learn to do by doing," urges the college on in its tremendous responsibility for four of the most valuable years of human personality development.

Manuscript received November 26, 1930

Neutralizing Inequalities in Rating

BY ADELBERT FORD, *University of Michigan*

The tendency to accept rating scores on employees without modification, where several different foremen are reporting scores, leads to unscientific and unfair evaluation of employees' efficiency. Inaccuracies due to differences in severity standards among raters can be corrected, as Dr. Ford shows, by determining "correction factors" for each rater, based on the characteristics of the frequency curve. A method of doing this is described in detail.

WITHOUT entering into controversy concerning the relative merits of the various methods of reporting scores in a rating scale, we wish to show here a simple method by which certain errors in rating scale scores may be neutralized. The particular method here presented is advised for any situation where two or more raters are turning in reports on the same employee and the various raters are suspected of displaying strong differences in their standards of grading. Such situations will arise in a 3-point, 5-point, 10-point, or straight percentage method of grading employees, and are very prevalent in the graphic rating scale. The method is not applicable to order-of-merit procedures.

Suppose that A and B and C are three foremen who report ratings on their men on the basis of a percentage system of scoring. A, a lenient grader whose scores all fall between 75 and 100, may give too many men the benefit of the doubt. B is a severe

grader whose scores fall between 50 and 75. He has possibly an unreasonably high standard of performance. C grades the good men very high and the poor men low; his scores fall between 25 and 100—a wide distribution in many respects desirable. If these three men are handing in grades on different groups of men they may argue that their scores express real differences in ability. It will appear, however, that such wide differences between different groups is improbable and that some correction must be made. A crucial test may be made by asking the three foremen to grade the same group of men. In this case the differences in grades will appear to be due to differences in standards of grading rather than to differences in individual ability. Such a process of checking the ability of graders to keep an even standard may be accomplished when employees are moved from one foreman to another, or when a foreman is transferred from one department to another, or when two or more

supervisors know the work of the same employees. Thus we may secure several foremen's ratings on each man.

We may try to correct the differences in standards by teaching foremen how to make grades, by insisting that the average man shall have a score of 75 and that the range of scores shall be between 50 and 100. Practical foremen are usually not accustomed to clerical technicalities. Every time we make the process of grading men more complex, or hedge the activity around with qualifications of procedure we encourage lack of adequate understanding on the part of a foreman, promote disgust at typical "white-collar" methods of the personnel engineer, lower the coöperative tendency in practical men, and hasten the use of pure guessing. If adequate corrections for errors can be used in the personnel office by trained workers, we may relieve the foreman of much of the worry in making grades in such a way that the scores from one rater may be compared on an equivalent basis with the scores from another rater. We should desire a situation where equal grades from foremen A, B, and C represent men of equal ability in the traits specified in the rating scale, where scores of 90 per cent represent men equally fit for promotion no matter what foreman reported the grades. Much personnel research is lost by the necessity of waiting until the raters are sufficiently trained to produce scores which are comparable from the standpoint of severity standards, and it is doubtful if we can ever get raters so thoroughly trained that scores will be free from this error.

The use of a three or five point scale of grading often merely obscures the tendency.

In grading about 350 electrical substation operators and helpers by a percentage system of scoring we found evidence of wide differences in severity standards even where the greatest patience had been exercised in giving the foremen directions for scoring. There was little difficulty in training the foremen in the subject-matter to be used in making the employee examinations, but it was almost impossible to give them an adequate understanding of the significance of a probability curve or the desirability of a distribution of marks with such a range that an employee would have an equal chance of promotion or dismissal, no matter what foreman reported the scores. We, therefore, adopted certain correction factors for the scores reported by those foremen who displayed an especially high variation from the average range of marks. A group of employees was found who had been graded by each of the foremen in question on the same examination, each man having a grade from each of the foremen.

The process of correcting the foremen's scores on their employees to neutralize differences in severity standards may be illustrated by referring to figure 1 which pictures the ratings of foremen A, B, and C cited above. All three curves represent the frequency of scores secured from the same 50 men. Since the wider distribution of foreman C seemed in many respects a desirable curve because of the fact that the extremely good employees were more completely

selected from the extremely poor employees, we used C's curve as the model. The method involves, mathematically, merely a process of transposition of A's and B's curves and their superimposition over C's curve. This

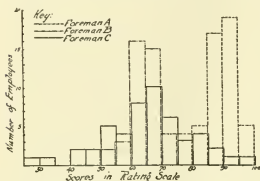


FIG. 1. DISTRIBUTION OF GRADES BEFORE CORRECTION

requires at least two distinct manipulations: (1) moving A's and B's curves along the base line in such a manner that all their *means* coincide; and (2) spreading the narrow range of A's and B's curves so that their *mean deviations* are all identical. If there were a distinct difference in skewness in the various curves we might possibly have to consider a third correction factor for this element. Such skewness, however, is not present to any great degree in the curves illustrated here.

TRANSPOSING THE MEAN

Letting M_A stand for the calculated measurement of the mean in Curve A, M_B stand for the mean of curve B, and M_C the corresponding measurement in curve C, we may derive a correction factor assuming curve C as the model on which both other curves are to be superimposed. $M_A - M_C$ becomes the difference in *average severity* be-

tween raters A and C. $M_B - M_C$ becomes the average difference in severity standards for raters B and C. The quantity $M_A - M_C$ is now subtracted from every score turned in by foreman A on every employee. In a similar way the quantity $M_B - M_C$ is subtracted from every score turned in by foreman B on every one of his employees. Although the correction factor for the *mean* was determined for all three raters on the same men, we now apply the same correction figure to new scores turned in by the same foreman, providing, of course, we dare assume that there is no change in the individual foreman's severity standards. If we have reason to believe that there is a change, we must re-test the foremen to obtain a new correction factor. The appearance of the new distribution of grades, after the *means* have been transposed, is indicated in figure 2.

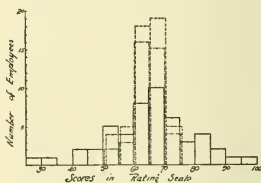


FIG. 2. DISTRIBUTION OF GRADES AFTER MEANS HAVE BEEN TRANSPosed

It is evident that the men in the middle ranges of these curves will now be considered as equal, but there is a discrepancy at the extremes. C's poor men are still rated as worse than B's or A's men, and his good men are

rated as much better—an error due to the difference in the breadth of severity standards. In order to give A's and B's men an equal chance with C's men for promotion or discharge, we must spread their respective distributions of grades to match.

TRANSPOSING THE RANGE

If we accept some customary measurement of dispersion of a frequency curve we may adopt a correction factor for each foreman which will approximate a way of changing the grades of the employees in such a manner that we have eliminated the error of differences in the breadth of severity standards. If the *mean deviation* of A's ratings is represented by MD_A , the *mean deviation* of B's ratings by MD_B , and the corresponding measurement of C's ratings by MD_C , (the ratings having been previously corrected by the application of the above factor for differences in the mean), we may adopt $M_A \pm d (MD_C/MD_A)$, wherein d is the employees' deviation

from the *mean*, as the corrected score of each of A's men. $M_B \pm d (MD_C/MD_A)$ becomes the score of each of B's men. The result of such a process on the distribution of scores is illustrated in figure

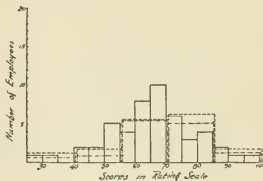


FIG. 3. DISTRIBUTION OF CORRECTED GRADES

3. From the appearance of this curve it will be evident that A's, B's, and C's employees now have an approximately equal chance of promotion or discharge. The scores of men rated by different foremen are now comparable, providing of course that the original ratings were relatively comparable.

Manuscript received June 14, 1929

Common Colds

BY WILSON G. SMILLIE, M.D., *Harvard University*

Personnel managers in factories and large offices have asked what their recommendations to the employees should be when an epidemic of colds begins to upset the production schedule. We turned for an authoritative statement to Dr. Smillie. As the reader will see, this very expensive nuisance, the common cold, is a problem which remains unsolved. We have no practicable method of prevention and no satisfactory method of treatment.

THE common cold produces more days of illness and more loss of time from work than any other type of sickness though it is almost never a cause of death. This is particularly true of the temperate zone, less true in the tropics. The disease occurs throughout the world, from the arctic circle to the equator, but is less prevalent in the tropics, runs a milder course there and is seldom followed by severe secondary complications.

Studies by Jordan and his co-workers in college students, Sydenstricker and Collins of the U. S. Public Health Service, van Loghem in Holland and many others, have shown that in the temperate climates, the average person has about two colds a year. A few fortunate individuals never have colds, another small group has colds four or five times a year, but the great mass of the population has at least one, more probably two colds a year. This means that an attack of the disease does not confer permanent immunity, as happens in so many diseases, as

for example, small pox, diphtheria, typhoid fever, measles, etc.

SEASONAL PREVALENCE

Colds are rare during the summer months. The curve of incidence rises rapidly in late October, reaching its peak about the end of the month. A drop occurs in the curve, then a second rise, which usually reaches a higher peak than the first, the highest point usually coming in the latter part of February. This curve of incidence has been noted in various parts of the United States, both north and south, and in Europe. In the tropics (West Indies) the disease as a whole is much less frequent, but the incidence curve is similar. In other words, the average person has his first cold in late October, then a period of temporary immunity for three months and a second cold in February. Thus the incidence curve of colds suggests that there is a definite relationship between changes in atmospheric temperature and the occurrence of colds.

One important factor in the produc-

tion of colds seems to be a rapid drop in atmospheric temperature. But colds are not a necessary concomitant of cold weather, as is shown by the experiences of the polar explorers. Peary, MacMillan, Byrd and other polar explorers assure us that the members of their expeditions do not suffer from colds during the severe exposure incident to their work, but frequently contract colds on first contact with the outside world. This is the story also that comes from Labrador, Spitzbergen and other isolated populations in frigid zones. One explanation of this phenomenon is that colds are a contact infection, and require a large population with rapid transportation and thus frequent contacts in order that the disease may continue to propagate itself.

DEFINITION OF COLDS

A cold is an acute inflammation of the membranes of the upper respiratory tract. It usually begins in the nose, then extends to the throat, and finally to adjacent membranes. It is usually accompanied by a feeling of weakness, headache and sometimes fever. The acute stages last two to four days. Onset is usually sudden—recovery rather slow. Secondary and sometimes serious complications may follow colds, such as infection of the ears, particularly in children, infection of the sinuses, bronchitis, and most important of all, pneumonia. There is a large group of diseases that, in the early stages, resemble colds and may be mistaken for an attack of acute cold at first, but which become clearly identified as the disease progresses.

In this group are included diphtheria, scarlet fever, septic sore throat, measles, tonsillitis, as well as "hay fever" and similar conditions due to protein sensitivity.

All the diseases that have just been mentioned are readily differentiated from colds because of characteristic symptoms that soon appear, and also because in each case, we know the causal agent (except measles). Influenza, when it occurs in widespread severe epidemics, is apparently quite a distinct disease from colds. When seen in mild form, it resembles a bad cold so closely that the two diseases cannot be distinguished. Influenza and colds are so closely related that one may predict that when we have solved the riddle of the one, the other will be solved as well.

THE CAUSE OF COLDS

We do not know the causal agent of colds. The disease has been studied very extensively from two points of view:

1. The cause of colds is an infectious agent, spread by direct contact from person to person.
2. The cause of colds is a disturbance in bodily physiology, due to change in our environment, particularly a drop in atmospheric temperature, or due to exposure to drafts, and chilling of the body surface.

1. Infectious nature of colds. There is a mass of evidence which indicates that colds are due to an infection, which is spread from person to person. This unknown agent exists in the secretions of the nose and mouth of persons

who have an acute cold, but is only present for three or four days. It is spread by direct contact. The infected person develops symptoms within one or two days after exposure. This has been clearly shown in the studies of acute respiratory disease in isolated communities—South Alabama, Labrador, and the West Indies, by Smillie and his co-workers.

But bacteriological studies of these secretions from the nose and throat of persons with acute colds have been of no avail. Studies have been made by Dochez and his assistants, Noble, Smillie and Burky, and others, of the bacteria of the nose and throat of normal persons through a long period of time. During the studies, at one time or another, many of these persons have had colds. A large number of bacteria were found in the throat, either as constant or casual inhabitants, but no single type has been incriminated as the cause of the infection.

Foster filtered the nasal secretions from cases with acute colds through a Berkfeld filter, removing all the well known bacteria. He inoculated this filtrate into soldiers who volunteered for the experiment, and produced an infection in these men. Others have been unable to secure similar results and his work has been questioned. Doull and Long in Baltimore, in 1930, filtered nasal secretions from cases of colds through a Seitz filter. This filter does not permit the passage of any bacteria that we have been able to cultivate, but it does permit certain types of filterable virus to pass.

The investigators inoculated this filtrate into the nose of healthy young

women who had been isolated from other people for about five days. Some of them developed colds.

These experiments offer strong evidence that colds are infectious—are spread by the secretions of the nose and throat, and are due to a filterable virus.

2. *Influence of environmental factors in production of colds.* The very word "colds" suggests the popular conception that the disease is due to changes in atmospheric temperature. We have already pointed out the relationship between colds and season. Van Loghem noted in Holland, that epidemics of colds follow sharp drops in temperature. Milan and Smillie made observations on colds in the tropics, where the temperature is constant throughout the year, the temperature of the coldest night seldom dropping lower than 68°F. But even under these tropical conditions, outbreaks of colds were found to coincide with sudden drop in temperature of a few degrees. Paul noted on the non-magnetic ship "Carnegie" that the scientists and crew would be free from colds for long periods while at sea and during equable temperature, but that an epidemic occurred when the ship suddenly entered the cold Humbolt current.

Chilling of the body surface seems to predispose to colds. This may occur when those persons with a sedentary occupation are exposed to draft or when individuals sit at work all day with wet feet, or whose working place is in a cold, humid atmosphere.

We may conclude, therefore, that environmental influences play an important part in the incidence of colds

though we cannot state that colds are caused by *exposure alone*.

COMPLICATIONS OF COLDS

An acute cold is self-limited (5-7 days duration) and seldom is serious. It often paves the way for serious secondary conditions, such as infection of the antrum and other sinuses, infection of the ear, bronchitis, and pneumonia. These conditions are due to bacteria with which we are familiar. The studies of Smillie and Caldwell in Alabama showed that when persons with an acute cold exposed themselves to chilling, they often developed pneumonia. The fourth to fifth day of the cold was the critical period. It was found that *Pneumococci*, the organisms usually responsible for pneumonia, increased greatly in the throats of persons with acute colds, reaching a maximum on about the fifth day. When some of these people got thoroughly chilled by exposure to rain and winds they promptly developed pneumonia.

PREVENTION OF COLDS

No practical method for the prevention of colds has been discovered. It is almost impossible for a person in active life to avoid all contact with every person with an acute cold during the epidemic season. Invalids and infants can and should be protected, for both of these groups suffer severely from the complications of colds. Protection is obtained by prevention of contact with persons who have colds and by prevention of exposure to rapid changes in temperature.

Gargles and local disinfectants are of no proven value. We have no

conclusive evidence that hardening the body by cold baths, outdoor sleeping porches and so forth has reduced the susceptibility to colds in the least. Proper ventilation, heating, and humidification probably aid in the prevention of complications of colds, particularly sinusitis. Working, living and sleeping rooms should be well ventilated, and should not be overcrowded. People working quietly should avoid drafts and the air of the workroom should have the proper temperature and humidity.

Vaccines seem to have been of value in about half of the cases in which they have been tried. In view of our present opinion as to the cause of colds, it would seem that vaccines are of little value in the prevention of the onset of the acute cold, but may be of real value in prevention of the chronic complications that may follow the acute attack.

TREATMENT OF COLDS

A person with a cold should guard against fatigue, exposure, and particularly against chilling of the body surface during the acute attack. Rest in bed during the early stages—particularly during the period when the person has fever—may prevent the development of serious consequences to the patient, and also checks the transfer of the disease to others in the community.

Most families have their own favorite home remedies for the treatment of colds. We have no evidence that these remedies influence in the least the course of the disease or cut short the duration of the illness. They do relieve some of the symptoms, make

the patient more comfortable, and other members of the family are made happy because something is being done for the patient.

SUMMARY

We do not know the cause of colds. There is strong evidence that the disease is due to an infectious organism, probably a filterable virus. We believe that this infection is spread by direct contact, from person to person. Some people are entirely immune, but most people contract the infection once or twice a year. We have strong evidence also that environmental factors, particularly an abrupt drop in atmospheric temperature, play an important part in the production of colds. The

acute cold itself is self-limited in duration and seldom causes death. It is often followed by secondary complications, some of them serious. We have no specific method for the treatment or prevention of colds, except avoidance of exposure to infection. Since everyone living an active, busy life is brought into close contact with a large number of other people, it is not possible for one to avoid exposure during the epidemic seasons. The serious complications that sometimes follow an acute cold can be avoided in some instances by rest in bed and avoidance of chilling of the body surface during the acute stages of the disease.

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Visibility of Objects as Affected by Color and Composition of Light

Part I. With Lights of Equal Luminosity or Brightness

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For a workman to see his work clearly and without eye fatigue, the lighting must be right, and also the contrast between object and background. Drs. Ferree and Rand report a series of painstaking laboratory investigations on the color and composition of light as affecting ease and accuracy with which objects are seen.

Stimulated by a desire to discover the specifications of the ideal printed page and of other working surfaces requiring high visibility, such as license plates, signals, and reading scales of instruments, the following investigation was made. (1) The physical factors which affect the visibility of objects are analyzed. (2) Possible methods are discussed for determining experimentally the kind and comparative extent of the effect of these factors. (3) The effect of two of the factors, namely, color and composition of light, is studied. This study is made under two conditions (a) with lights of equal luminosity or brightness and (b) with lights equalized both in luminosity and saturation of color. In one set of experiments spectrum light was obtained from a large, specially designed, monochromatic illuminator, in order to have a definite and specified composition of light of a high degree of purity. In another set of experiments colored light, complex in composition but of daylight quality, being obtained with Macbeth artificial daylight filter. The functions tested include acuity, speed of discrimination, power to sustain acuity, and ocular fatigue. With reference to all of these functions it was found that the eye gives its best performance in the mid-region of the spectrum, but that light of daylight quality is more favorable than any color, even when of spectrum purity, for the discrimination of such details and relations to background as are found in the printed page.

The eye apparently was not intended to work under what is ordinarily called colored light. Color in light seems to be especially trying to eyes suffering from pathological disturbances and other defects of vision.

INTRODUCTION

A SPECIAL incentive for this investigation was a request from the American Writing Paper Company, of Holyoke, Massachusetts, who in seeking for the specifications of the ideal printed page wanted to know the effect of the color of the page or other working surface on the functional powers of the eye. A further incentive has been the realization that this research might well throw light on such matters as: the comparative evaluation of lighting situations and installations; the selection of objects and the arrangement of objects and background in various industrial tasks; and the choice of combinations of object and background for certain types of test charts, for clerical forms, for signs, signals, license plates, tags, reading scales of instruments and other designations requiring high visibility.

The three most important physical factors in the visibility of objects are size of visual angle of the detail to be discriminated, difference in relation of object to background, and intensity of illumination. These factors are of course interacting in their effect on the eye. That is, changes in size will produce different changes in visibility with different relations of object to background and at different intensities of illumination. A 1-min. visual angle, for example, represents a very low visibility at a low intensity of illumination or with a small difference in coefficient of reflection between object and background, and a comparatively high visibility at a high illumination or with a large difference in coefficient of reflection between object and background. The visibilities for two values of visual

angle may sustain one ratio at one intensity of illumination and relation to background and quite a different ratio at another intensity of illumination and relation to background. In short, a scale showing the relation of size of object to visibility determined for one intensity of illumination and relation to background cannot be expected to hold for other intensities of illumination and relations to background. It is not our purpose in this paper, however, to discuss in any great detail the intricacies of these interactions.

The influence of size and relation to background on the visibility of objects is in the main perhaps obvious to all, i.e., we see objects because of their size and their difference from the background. Just what part is played by intensity of illumination is, however, not so obvious. In case of an achromatic difference between object and background there seem to be two possibilities as to the influence of the intensity factor: (1) an effect on the visual or sensation difference from the background; and (2) an effect on the visual or apparent size. The first effect has been treated by us in former papers.¹ The points related to this effect may be summarized as follows. (a) With a given difference in coefficient of reflection the visual or sensation difference is greater in case of white objects on black or light objects on dark back-

¹ Intensity of light and speed of vision studied with special reference to industrial situations. Part II, *Trans. Illum. Eng. Soc.*, 1928, 23, 507-542; Lighting and the hygiene of the eye. *Archives of Ophthalmology*, 1929, 2, 1-26.

grounds than it is in case of black objects on white or dark objects on light backgrounds. (b) The sensation difference increases rapidly with increase of intensity of illumination.² And (c) the increase is more rapid for white objects on black or light objects on dark backgrounds than for black on white or dark objects on light backgrounds.

The second effect will be made the subject of a later paper. With reference to it, however, a few words may be said tentatively here. (a) There is an irradiation or spreading of the excitation aroused by the image on the retina, the amount of which is affected by the intensity or density of the light in the image. The influence of this is to increase the effective size of a detail in black on white or in dark on a light background and to decrease the effective size of a detail in white on black or in light on a dark background. And (b) an increase in the size of a luminous or illuminated area gives an effect of increase of intensity, but not in proportion to the increase in size. This action may be reciprocal, *i.e.*, an increase of intensity may give to some extent the effect of an increase in size.

² There are several factors involved in this effect: (a) size of pupil; (b) difference in amount of light reflected from object and background with a given difference in coefficient of reflection; (c) the selectiveness of the sensitivity of the eye at different points in the intensity scale and the variations of this with state or stage of adaptation; (d) relation of object to background, light on dark or dark on light; etc. The net result of all the factors is that the visual or sensation difference of the object from its background increases rapidly with intensity of illumination.

Such an effect, however, so far as we know, has not as yet been shown experimentally.

It is in part the purpose of the present paper to consider the effect of chromatic or hue difference between the object and its background on the visibility of the object. Three cases can be made of this problem: (a) when both object and background are colored; (b) when the object is colorless and the background is colored; and (c) when the object is colored and the background is colorless. Our study has been thus far limited to the second of these sets of conditions,—a colorless object on a colored background.

In approaching an investigation or study of the effect of any of the above factors on the visibility of objects one is confronted with the question of a measure of visibility. In conventional acuity testing, size of object or visual angle has itself been taken as the measure of visibility, and the power to see has been rated in simple inverse relation to the size of the smallest detail that can be discriminated. That is, apparently a detail subtending twice the visual angle of another detail is assumed to have twice its visibility; three times its visual angle, three times its visibility, etc. The visual angle and the visibility scale are assumed to be numerically equivalent; and power to see, or vision as it is usually called, which probably should be considered to sustain a simple inverse relation to visibility, is also considered to sustain an inverse relation to visual angle. In this connection it may also be pointed out that eyes have frequently been rated as having the same vision or

power to see when the tests were conducted at very different intensities of illumination and with different relations of object to background.

Such assumptions with reference to visibility and to vision are justified of course only in case it is held that visual angle and visibility sustain to each other a 1:1 relation. Visual angle is a very important factor in visibility, but it is scarcely necessary to say at the present stage of advancement in the analytical study of the visual function that this equivalence of visual angle and visibility does not exist. As already indicated, visual angle does not even sustain a fixed relation to visibility unless the other factors affecting visibility are held constant. Even as a matter of record, therefore, any attempt at a specification of vision in terms of visual angle alone, presupposes constancy of conditions with reference to the other factors. Without this constancy the specification is not adequate for the purpose of securing reproducibility of result. A scale expressing the correct numerical relation between change in visual angle and change in visibility can not be given at the present time and perhaps can never be given with a satisfactory degree of accuracy. Comparisons can be made, however, of the ratings based on visual angle with those obtained from testing other important aspects of visibility.

With reference to the comparative effect of the three important factors: size, relation to background, and intensity of illumination on the visibility of objects, we have found that speed of seeing taken as the reciprocal of the shortest time in which the discrimina-

tion of the detail in question can be made, is a sensitive measure of visibility. The direct measure in any instance would have to be, of course, in terms of just noticeable steps or differences in visibility. The judgment required for this measure would, however, be difficult to make and the procedure in determining the steps of difference so time-consuming as to be somewhat infeasible for the many conditions or situations in which a factor may be operative. The correctness of speed as a measure, if visibility is conceived as that obtained with the optimum time of exposure, is vitiated to an extent as yet unknown by the selective action of the factors in question on the rate of rise of sensation. Considered in relation to its practical bearing, however, speed is a very important aspect of seeing and of visibility. Also, in case of the present study it has the advantage of being completely outside the group whose effects are to be compared, i.e., within the group the effect of varying any two could be compared using the third as a measure, but the effect of the third could not enter into the comparison.

To the test for speed of vision may be added two others which also have an important relation to visibility: power to sustain clear seeing, and loss of visual efficiency, or ocular fatigue. These tests are more sensitive than the test for speed of vision and like it have the advantage of being entirely outside the group whose effects are to be compared. Considered with respect to their practical bearing they also deal with very important aspects of seeing, i.e., while the test for speed shows the eye's quickness of response, these latter

two tests show the power of the eye to sustain a given level of performance. In the acuity test, the size of object is taken directly as the measure of visibility and the power to see produced by a given set of conditions is rated inversely as the size of the smallest detail that can be discriminated. In the tests for speed of vision, power to sustain clear seeing, and loss of visual efficiency, size of object is considered as only one of the factors whose effect is to be measured. That measure is in terms of the eye's performance,—at least it is not measured in terms of any aspect of the stimulus or of an assumed relation between changes in this aspect and changes in the eye's response or performance.

In the direct measurement of a performance two factors are to be considered: the amount or magnitude of the performance in a unit of time and its time or duration. For an absolute measurement both of these quantities must be determined. As indicated above, the closest approximation of the measurement of the amount of visual performance is in terms of the number of just noticeable differences taken as units. The time or duration can of course be measured with comparative ease and exactness. In the tests for speed, power to sustain, and loss of efficiency through a period of work, the amount of the performance is not measured. It is taken account of, however, in the following ways. In the test for speed, the response is multiplied by the time required to give an amount which we call the threshold, or rather it is allowed to integrate through that time and the speed is taken as the inverse or reciprocal of the

time. In the test for power to sustain, an amount of response which, so far as we know, is constant or approximately so, is in effect multiplied by the time for which it is given. However, since there is no direct measure of the amount of response, the time for which it is given or rather the ratio of this to the total period of observation, is taken as the measure of power to sustain. In the test for loss of efficiency this ratio is compared before and after a period of work. In all three of these tests the measure is in terms of the time for which the response is given and is therefore relative, not absolute.

In this study all of the tests discussed above, acuity, speed, power to sustain, and loss of efficiency through a period of work, have been used for the sake of what they may reveal. It is interesting to note that the order of ranking of the conditions tested, but not the amount of the effect, is the same for all the tests, with one exception. That exception will be stated later in the paper.

Some further discussion of the tests may be of interest and importance here.

In 1911 we were asked by a joint committee of the American Medical Association and the Illuminating Engineering Society to devise some means of studying the effect of lighting conditions on the eye. Finding that the acuity test as ordinarily used is not sufficiently sensitive to detect the small changes in functional condition caused by comparatively short exposures to differences in what may be called the illumination or distribution factors, we devised two ways of adding sensitivity to the test. In both of these advantage is taken of the important relation of time to powers of performance. One (speed of vision or speed of discrimination) demands the quickest possible use of the eye; the other (power to sustain) re-

quires the eye to sustain clear seeing without interruption for a period of time.

By increasing the difficulty of the task imposed on the eye both of these modifications add greatly to the sensitivity of the acuity test or any type of test based on the discrimination of detail. In addition they test functions which are of great importance to the working eye. A third modification, which we have not as yet described, may be called a test of power to sustain speed of discrimination. In this test the power to maintain any given speed of discrimination will be measured.

It is obvious that any of these tests may be used alone to compare the eye's powers of performance under different lighting conditions provided they are given a satisfactory sensitivity and reproducibility; or they may be used in connection with a period of work. In this latter case they should be applied at the beginning and end of the period and the two results be compared for changes caused by the work. We have called this latter type, a test for loss of efficiency or fatigue. In it the test for acuity, speed, power to sustain acuity, power to sustain speed or any other acceptable test may be applied before and after the period of work. Because of its superior sensitivity we have chosen thus far to use power to sustain acuity despite the care and skill required for its control. As test-objects we have used the broken circle, rotated to provide for an objective check on the judgment, for acuity and speed; and the letters "li" for power to sustain acuity and its elaboration into the test for loss of efficiency.³

³ We were the first, we believe, to introduce into acuity testing the practice of rotating a single test-object sufficiently complicated in form to test acuity simultaneously in several meridians, for the purpose of imposing an objective check on the judgment. An objective check, however, could not be used in connection with the test of power to sustain acuity without causing changes in the fixedness of adjustment which would operate to relieve the strain imposed upon the eye and thus destroy the sensitivity of the test. Repeated efforts were made to use objective checks of various kinds with this test without success.

Other suitable test-objects could have been employed. We have chosen these, however, because of their superior merit, after a long trial of many.⁴

The test for power to sustain clear seeing may thus be used by itself or it may be used in connection with a period of work. When used by itself, we have found it absolutely necessary to allow at least twenty to thirty minutes to elapse between two successive tests. This amount of rest is required to permit the eye to recover from the fatigue of the preceding test and to give the results a satisfactory reproducibility. Both forms of the test must also be used with an adequate control of the other factors which influence the constancy of the eye's response,—two of the most important of which are adaptation and practice. When used by itself, *i.e.*, not in connection with a period of work, all records for lighting conditions the results of which are to be compared, are made at the same sitting. This was done to avoid the effect of possible changes in the condition of the eye from day to day. When used in connection with a 3-hour reading period, however, the tests have to be made on different days. The effects of difference in conditions in the eye are minimized in this case because the change affects the initial as well as the final record with which it is compared. As a further precaution in this connection the results of any given test should be discarded unless the initial record shows the eye to have been in a satisfactory condition. This precaution has been rigorously observed in all our work. The plan of the experiments and the necessary control of factors have been fully described in previous publications.⁵

A brief analysis of factors in a lighting situation and a discussion of their relation to the functions tested may also be of interest before the consideration of the experimental work is taken up.

⁴ See *Trans. I. E. S.*, 1913, 8, p. 44; 1915, 10, p. 412, 1125; 1920, 15, p. 773; *Amer. Jour. Ophthal.*, 1920, 3, p. 409.

⁵ In this connection see especially *Trans. I. E. S.*, 1927, 22, 52-75; 1913, 8, 40-57; 1915, 10, 1122-1130.

ACUITY

Considered with reference to the eye, there are three factors in acuity or the power of the eye to see clearly,—the resolving power of the refracting media, the space discrimination of the retina, and its sensitivity to light. To put it in another way, there are the resolving power of the refracting media or the power to form clear images on the retina, and the resolving power of the retina or the power to discriminate detail in the physical image formed.

Considered with reference to the stimulus light, six factors may be mentioned that are effective in acuity,—the *physical factors*: intensity, wave-length, and purity of light; and their three *subjective aspects*: hue, saturation, and brightness. Of these, wave-length and purity alone affect the resolving power of the refracting media or the power to form clear images. Intensity, hue, saturation and brightness affect the power to discriminate details in these images, or what we have called the resolving power of the retina. For example, the ease with which the details in a black test-object can be discriminated on a colored background varies both with the hue and saturation of the color. Moreover the factors hue and saturation are interacting. That is, the effect of hue varies with the saturation and conversely the effect of saturation varies with the hue. A part of the advantage of yellow over the other colors is doubtless in part due to its low saturation.

One is tempted to add clearness as a fourth subjective aspect of color. The test surface illuminated by blue, blue-

green or red seems somewhat as if it were viewed through a solution in which some of the pigment was not dissolved but held in suspension. However, this visual murkiness is perhaps a combination of the effect of hue and saturation, and not a separate factor. In white light vision at good intensities one might almost be led to think that he is dealing directly with the physical image so clear and stable are the processes involved. In color vision the situation is different. So many phenomena occur to confuse clear seeing in color vision that one falls quite naturally into the use of such explanatory terms as the resolving power of the retina.

Wave-length affects the clearness of imaging through diffraction. Because of this phenomenon faint rings of light form about each point in the image. These rings, known as diffraction rings, overlapping neighboring points, serve to blur the image. Their breadth, or at least their effective breadth, varies directly as the wave-length of light and inversely as the aperture of the lens used. From this it follows that clearness of imaging varies inversely as the wave-length of light used and that the lens should have its highest resolving or image-forming power for the shorter wave-lengths of the spectrum.

From this it might be expected that light made up of the shorter wave-lengths would give the greatest clearness of seeing. In microscopy apparently this is true, *i.e.*, the short wave-lengths bring out with greater clearness the details in the microscopic field. While microscopy, therefore, undoubtedly serves as a good means of demonstrating or illustrating the factors which influence the resolving power of the refracting media, it is apt to be misleading or confusing as to the relative importance of these factors in vision without the microscope as an accessory. That is, in the latter case the eye views its object directly, not an image of the object formed by an accessory refract-

ing system as in microscopy. In microscopy therefore the relative importance of resolving power of the refracting system and of the factors which influence it is greatly amplified and exaggerated as compared with their importance in ordinary vision. The microscope is in fact just an amplification or extension of the eye's refracting system. It does not affect the resolving power of the retina. A discrepancy should not be surprising, therefore, between the effect of wave-length of light on acuity as is represented in the natural use and power of the eye, and in the eye whose powers are amplified by means of a microscope. In one case, it would appear, the resolving power of the retina is dominant; in the other the resolving power of the refracting system.

Purity of light affects clearness of imaging through chromatic aberration. Aberration circles form about each point in the image due to the difference in the focal length of the lens for the different wave-lengths. Clearness of imaging which depends upon the number and breadth of these circles, sustains a direct relation, therefore, to the number of wave-lengths making up the light in question and their displacement from each other in the spectrum. The influence of *composition* of light is a combination of the effects of wave-length and purity: the shorter the wave-lengths and the greater the purity, the clearer is the image formed. The effect of *hue* on the power of discrimination should be discussed in relation to the type of detail that is to be discriminated. If the detail is a black letter or other printed character, hue of light determines the quality of the background from which it must be distinguished. Some hues are apparently more favorable than others as a background for the discrimination of details in black. All hues are inferior to white in this regard. Repeated tests have shown that white is the best background on which to discriminate details in black. *Saturation* may be defined as the proportion of the chromatic to the achromatic component in the sensation. As the saturation is increased for any hue its inferiority in relation to white as a background for the discrimination of details in black is increased. *Intensity* as a factor should be discussed in relation to kind of

light. In case of white light the effect of increase of intensity is to increase its luminosity or brightness. This increase in luminosity gives a greater power for clear seeing independent of sharpness of imaging. There is no doubt that up to a certain limit the power of discriminating detail in the achromatic or colorless image is greatly increased by increase of intensity. Rapid at first, the increase becomes slower as the higher intensities are reached. For colored light, however, the case is not so simple. There is a similar increase in the power of discrimination with increase of intensity through increase of luminosity, but the benefit produced by the increase in luminosity is complicated by the effect of changes in *saturation* and *hue*. These changes may become more or less favorable as the intensity is changed and add to or subtract from the power of clear seeing correspondingly. The effect of increase of intensity of light on the color sensation may be described as follows. There is an increase of luminosity which is more or less regular over small ranges of the intensity scale and this is of course a benefit. *Saturation* increases to a maximum and then decreases to zero or a very low minimum. The point of maximum saturation is reached at a comparatively low intensity and the change throughout is much less regular than the change in luminosity. Up to the point of maximum saturation, then, saturation change works against clear seeing; beyond this point the change is favorable to clear seeing. *Hue* is affected in a very complicated and irregular way by changes of intensity. A few of the hue changes for spectrum lights may be mentioned. All of the wave-lengths from red to yellow pass through yellow to white with increase of intensity beyond the point of maximum saturation. Green also passes through yellow to white with increase of intensity. All of these changes are favorable to clear seeing. At low intensities red becomes brownish; yellow, greenish; orange is tinged with greenish brown; and blue with purple. At very low intensities green is seen as blue-green or blue. These changes are in part favorable for clear seeing. In case of mixed colored light the effect of change of intensity on hue is greater in

amount and not always the same in kind. This might well be expected, because the effect of change of intensity here is not only upon the sensations aroused by the component wave-length, but also upon the physiological interactions caused by combining these wave-lengths. There seem in general to be two causes of the effect of the change of intensity on hue; an effect of the change of the achromatic on the chromatic component, similar in kind no matter how the achromatic component is changed,—by adding white light, by increasing the intensity of the light, by after-image, or by physiological induction or contrast; and an effect inherent in the process itself. This three-fold effect of intensity of light on the hue, saturation and luminosity of the color sensation must be taken into account not only in matters pertaining to clear seeing by colored light but also in all colorimetric work. A hue and saturation specification of a color for one intensity of illumination is, strictly speaking, valid for that intensity alone.

The explanation for the effect of intensity, luminosity, hue and saturation on the power of discrimination of detail is given, it will be noted, in its simplest and most direct terms, that is, in terms of qualitative differences in the sensations aroused by the images formed on the retina. Details subtending the same visual angle at the eye which present the greatest difference in sensation are the most easily distinguished from each other. This is so nearly self-evident that even to state it seems tautological. That is, our only method of detecting qualitative differences in sensation is based on ease of discrimination. It may be that some other way may be found for explaining the effect of these factors on the retina's power of discrimination, but at present the data are, so far as we know, not available on which to base a different explanation. It may also be that wave-length has some other influence on the resolving power of the retina than through the sensation qualities to which it gives rise, but as yet such considerations can be only speculative.

SPEED OF DISCRIMINATION

Speed of discrimination should be affected by everything that affects acuity, and to a much greater degree than acuity is affected particularly if the time of exposure in making the acuity determination is long. In addition there is a lag in the retina's response to light and color which differs with the wave-length and intensity of light. The differential effect of this factor, however, is probably quite well masked by the other factors which affect discrimination.⁶

POWER TO SUSTAIN ACUITY

The power to sustain acuity also should be affected by everything that affects acuity. This is particularly true with regard to factors which affect the resolving power of the refracting media, *e.g.*, slight astigmatism, etc. With regard to the resolving power of the retina, however, the correspondence does not seem to be so close. For example, colored lights giving a relatively high acuity may not give an equally relatively high power to sustain acuity. As a factor in the power of the retina to sustain its resolving

⁶ Observers having a slight manifest hyperopia showed a relatively greater lag of discrimination and a greater practice effect for the long wave-lengths, particularly the red; and observers slightly myopic showed a similar effect for the extreme short wave-lengths. The effect was also noticeable in the low hyperopic and myopic astigmatisms. The lag in the hyperopic meridian was relatively greater for the long wave-lengths; and the lag in the myopic meridian was relatively greater for the short wave-lengths. These are noted merely as interesting and suggestive observations. Before acceptance, they should be confirmed on a larger number of subjects.

power, the rate of decay of sensation for the different colors should be taken into account, also the phenomena which accompany decay when the retina is stimulated by colored light. For example, the streaming phenomenon which interferes greatly with the power to sustain clear discrimination seems to take place more strongly for some wave-lengths than for others, more par-

ticularly for the short wave-lengths. Green, blue, and blue-green seem especially active in producing this phenomenon. It may be stated as a general principle that the retina shows greater instability in retaining its resolving power under colored light than under white light, and that this instability is greater for some colors than for others.

ACUITY, SPEED OF DISCRIMINATION AND POWER TO SUSTAIN ACUITY AS AFFECTED BY VARIATION OF COLOR AND COMPOSITION OF LIGHT

In taking up the problem of visibility of objects and the working powers of the eye in relation to color of background, we found that it was neither practical nor feasible to work with colored papers. The control of factors needed could not be secured with colored paper without prohibitive trouble and expense. Essentially the same purpose can be served by using white paper illuminated by colored light, with a much better control of factors.

However, it is obvious that even by the use of colored light a complete separation of factors can not be accomplished. The best that can be done is to vary together certain closely related factors and hold the remainder constant. For example, wave-length, hue and saturation can be varied together and purity and photometric intensity or brightness can be held constant; hue, wave-length or composition, and purity can be varied together and saturation and brightness held constant; saturation, purity and composition can be varied and hue and brightness held constant; etc. Final conclusions as to

the relative importance of factors can not be drawn from any one series of determinations. They will have to come from an intercomparison of the individual series.

This section of the paper reports the first of these sets of variations. Spectrum light was required. In using spectrum light for this purpose two possibilities are open: it can be used to illuminate a test-object seen by reflected light (the determinations being then limited to low intensities); or it can be focussed on the eye, in which case higher intensities are possible. We have chosen the first of these alternatives for the following reasons. (1) It would be difficult to make the three determinations,—acuity, speed of discrimination, and power to sustain acuity—under comparable conditions with the light focussed on the eye. (2) Because of its superior sensitivity for picking up small differences in effect and its advantages for imposing an objective check on the correctness of the judgment we wanted to use the broken circle as test-object for the work on acuity and speed. No test-

object nearly so good has as yet been devised suitable for use with light focussed on the eye. (3) We have wanted to express acuity in absolute terms or visual angle rather than in relative terms. This could not be done with any test-object known to us which could be used with the light focussed on the eye. (4) At one of the intensities used, yellow gave an average acuity slightly greater than 1, 6/6, or 20/20 for all of the observers employed. Moreover, any further increase in this intensity caused a decrease in saturation for some of the colors, *e.g.*, yellow, orange and red. That is, at the higher intensity more than half of the colors were either at or above their maximum saturation. At the lower intensity yellow was approximately at its maximum saturation; the remainder of the colors were below the maximum. It seemed allowable, perhaps advisable, therefore, to conduct one series of experiments at these intensities even though they were considerably lower than the intensities found in practical lighting situations.

The light was obtained from a minimum deviation spectroscope designed especially to give high intensities, with long collimator and objective slits and correspondingly large lenses and prism. The collimator slit was 12 mm. long. The collimator lens was a Zeiss triple achromat 18 mm. focal length, 60 mm. diameter. The prism was 100 mm. high with a face 85 mm. in length. The source of light was a well seasoned Nernst filament mounted in exact alignment with the collimator slit and as close to it as possible. The filament and the collimator slit were enclosed in a light-tight housing to exclude the

light from the room. The breadth of the objective slit was 0.5 mm. The light from this slit spread directly to the test-object. The surface illuminated subtended a visual angle of 30×21.3 min. of arc at 6 meters. The variations of intensity were produced by varying the width of the collimator slit. The light reflected from the test surface was examined for purity with a small Hilger spectrometer furnished with an illuminated scale. No impurities above the threshold of sensation were found in any of the lights used after they had suffered reflection from the test surface.

The lights selected were narrow bands in the red (666 $m\mu$), orange (624 $m\mu$), yellow (578 $m\mu$), yellow-green (563 $m\mu$), green (522 $m\mu$), blue-green (501 $m\mu$), and blue (488 $m\mu$). Two intensities of light were used 0.075 and 0.3116 f.c. (0.81 and 3.35 m.c.) designated respectively in the curves following as Intensities I and II. The lower of these two intensities was the maximum obtainable for the blue in the spectrum employed. Neither the blue nor the blue-green could be obtained at the higher intensity. The lights were made photometrically equal at these intensities. The equalization was based on the average results of two observers practiced in making the judgments of heterochromatic photometry.

ACUITY

Three observers were used in making these determinations. The work was done in a dark room. The eyes were given a 30-minute adaptation period before any observations were made. Also before the final determinations

were made for each color a practice series of 15 minutes with proper rest periods was given. The broken circle (the international test-object) mounted on a rotating dial was used as test-object. In making the judgment all that was required of the observer was to indicate the direction in which the opening pointed. The judgment on which the estimate of acuity was based was thus reduced to very simple terms and an objective check was had on its

An exposure of 1 sec. was allowed for each judgment. The angle of incidence of light on the test surface was kept constant throughout the experiments. Constancy of position of the observer's eye was secured by biting a mouth board in which the impression of his teeth has previously been made and hardened in wax.

Curves showing the average results for the three observers are given in figure 1, A and B. In figure 1 A acuity

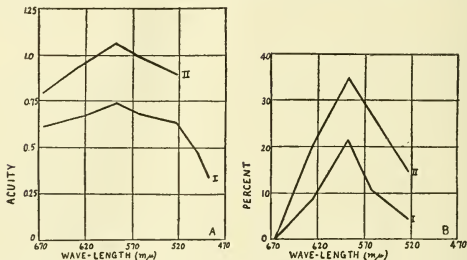


FIG. 1. SHOWING THE EFFECT OF CHANGE OF WAVE-LENGTH OF LIGHT ON ACUITY AT 0.075 AND 0.3116 FOOT-CANDLE OF LIGHT, INTENSITIES I AND II (3 OBSERVERS)

A, acuity plotted against wave-length; B, percentage change in acuity plotted against wave-length. The lowest value of acuity common to both curves in A is taken as the base on which to calculate the percentage change.

correctness. In the final series of determinations this opening was turned in haphazard order right, left, up, down, and the four 45-degree positions. The breadth of the opening was measured on a micrometer comparator and the visual angle computed. The coefficient of reflection of the test surface was 85 per cent. The pre-exposure and surrounding field were made in each case as nearly as possible of the same brightness as the test surface.

expressed as the reciprocal of the visual angle discriminated is plotted against wave-length. For the lower intensity the lowest acuity is found in the blue and the highest in the yellow. The ranking from highest to lowest is in the following order, yellow, yellow-green, orange, green, red, blue-green, and blue. For the higher intensity the order from highest to lowest is yellow, yellow-green, orange, green and red. At the higher intensity the acuity in

the yellow is 1.052. This is slightly greater than the Snellen norm for the emmetropic eye. The acuity for the yellow-green is approximately equal to the Snellen standard for the normal eye.

At the higher intensity the acuity was determined also for the Machbeth daylight glass transmitting the light of a Mazda type C lamp operated at 108 volts; and for the light of this lamp unfiltered. The acuity for the daylight glass was 1.125; for the Mazda lamp, 1.077, and for the yellow of the spectrum, 1.052. The comparison was not made for the lower intensity. The light transmitted by the daylight glass was a mixed light, but it had a considerable advantage for ease of discrimination over the yellow with regard to both hue and saturation. That is, the test surface illuminated by it appeared as a clear white on which the test character stood out with great clearness and distinctness. The uncorrected light of the type C lamp also suffered the disadvantage of being a mixed light but it had an advantage over the spectrum yellow in the saturation of the color component. Had the intensities been higher and the saturation of the spectrum yellow been correspondingly reduced, the result of the comparison might have been very different. As it was, however, the advantage of the spectrum yellow in homogeneity as to wave-length was more than overcome by its disadvantage in hue and saturation. Hue and saturation are very important factors in acuity. For example, the amount of color introduced into the light from the type C lamp by operating it at 90 volts gave it a lower acuity than the spectrum yellow, approxi-

mately equal to the yellow-green when the comparison was made at the lower of the two intensities.

In figure 1 B are curves showing the percentage change in acuity with change in wave-length for both intensities of light. In these curves percentage change of acuity is plotted against wave-length of light. In both cases the lowest value of acuity common to both curves in figure 1 A is taken as the base on which to calculate the percentage change. This is the acuity for red. Blue and blue-green are not represented in the curve for the higher intensity. The percentage change from red to yellow for the lower intensity was 21.4; for the higher intensity 34.7. The percentage change from blue to yellow for the lower intensity was 120.4. The change from red to yellow, it will be noted, was greater for the higher intensity. This was doubtless due to the relative change in saturation of the two colors with the increase of intensity. That is, yellow was around its maximum saturation at the lower intensity and lost saturation as the intensity was increased. This relative change in saturation will doubtless be found to be a strong factor in the relative acuities of the colors at different intensities of light. To investigate this point an intensity curve should be determined for the different colors and the shape of these curves be compared with that of the saturation curves for the colors.

SPEED OF DISCRIMINATION

These determinations were made for six observers. Again the test-object was a broken circle, the opening of which subtended a visual angle of 2.49

min. of arc at the observer's eye,—approximately the angle subtended by 10-point type at the conventional reading distance of 33 cm. The circle was mounted at the center of a graduated rotating dial. The exposures were made by means of a tachistoscope somewhat similar to that devised by us for the Air Service of the U. S. Army, furnished with only one set of exposure discs rotating in front of and as close as possible to the test-object. On the

period before any observations were made. Before the final determinations were made a practice series of 20 minutes, with proper rest periods, was given. In the final determinations eight positions of test-object were used,—up, down, right, left, and the four 45-degree positions.

The average results for the six observers for both intensities of light are shown in figure 2, A and B. In figure 2 A speed, expressed as the reciprocal

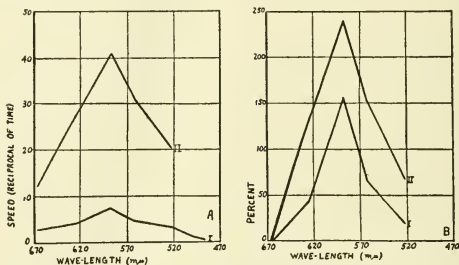


FIG. 2. SHOWING THE EFFECT OF CHANGE OF WAVE-LENGTH OF LIGHT ON SPEED OF DISCRIMINATION, INTENSITIES I AND II (6 OBSERVERS)

A, speed of discrimination plotted against wave-length; B, percentage change in speed of discrimination plotted against wave-length. The lowest value of speed common to both curves in A is taken as the base on which to calculate the percentage change.

front surface of these discs in line with the observer's eye and the test-object was placed a fixation cross in order that the exposure might be given with the eye in approximate adjustment for the test-object. The reflection coefficient of the test surface was 85 per cent. The angle of incidence of light on the test surface was kept constant for all of the determinations. The work was done in a dark room. The eye was given a 30-minute adaptation

of the time in seconds required to make the determination, is plotted against wave-length. The effect of change of wave-length on speed is much greater than on acuity, but in general the type of effect of the same. The order of rating from highest to lowest is, for the lower intensity, yellow, yellow-green, orange, green, red, blue-green and blue; and for the higher intensity yellow, yellow-green, orange, green and red.

The speed of discrimination both for

the Macbeth daylight glass transmitting the light from a Mazda type C lamp operated at 108 volts, and the unfiltered light from this lamp, was greater than for the spectrum yellow. The speed for the daylight glass was greater than for the unfiltered light of the type C lamp. The speed for the daylight glass was 58.46; for the Mazda lamp, 48.89; and for the yellow of the spectrum, 40.87.

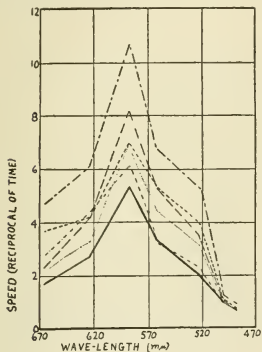


FIG. 3. THE EFFECT OF CHANGE OF WAVE-LENGTH OF LIGHT ON SPEED OF DISCRIMINATION

Showing the individual results for the six observers. Intensity I.

In figure 2 B are given curves showing the percentage change in speed with change of wave-length for both intensities of light. In these curves percentage change in speed is plotted against wave-length. In both cases the lowest value of speed which is common to both curves in figure 3 is taken as the base on which to calculate the

percentage change. This is again the speed for red. Blue and blue-green are not represented in the curve for the higher intensity. The percentage change from red to yellow for the lower intensity was 155.7; for the higher intensity, 240.0. The change from red to yellow, it will be noted, was greater for the higher intensity as was the case for acuity. And as might be expected, the difference in effect, which was in all probability due to the difference in the relative saturations of the colors, was greater for speed than for acuity. The percentage change from blue to yellow for the lower intensity was 867.8.

Figure 3 gives curves showing the individual results for the six observers. The general similarity as to type of result is obvious from these curves. The chief difference is in the order of magnitude of speed.

POWER TO SUSTAIN ACUITY

For these determinations a value of visual angle was selected slightly greater than the minimum visual angle for the color giving the lowest acuity, namely, the blue for the lower intensity of light. The value of this angle was 3.664 min. of arc. The test-object was the same as we have always used for the work on power to sustain clear seeing, the printed letters "li", the task being to resolve and hold clear for a period of three minutes the break between the dot and its stem in the letter "i." The breadth of the break was 0.6255 mm. and the visual angle was subtended by the break at the observer's eye was, as already stated, 3.664 min. of arc. A record was made on a kymograph with a key, electro-

magnetic recorder, and Jacquet chronograph of the time the break could be discriminated in three minutes, the measure of the performance of the eye being expressed as a ratio of the time seen clear to the time seen blurred. It could also be expressed as a ratio of the time seen clear to the total time of observation. There being no objective check on the correctness of the judgment, its precision had to be checked up by the size of the mean

been made and hardened in wax. The results of these determinations are shown in figure 4, A and B. In figure 4 A the ratio of time clear to time blurred is plotted against wave-length of light. The order of ranking of power to sustain is the same as for acuity and speed of discrimination with the exception of the ranking of red and green. The acuity and speed were higher for green than for red. In case of the power to sustain the reverse was

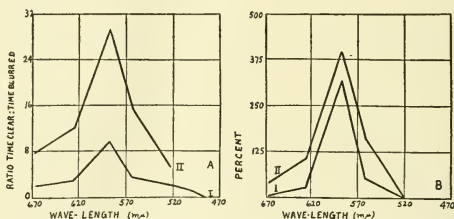


FIG. 4. SHOWING THE EFFECT OF CHANGE OF WAVE-LENGTH OF LIGHT ON THE EYE'S POWER TO SUSTAIN THE CLEAR SEEING OF THE TEST-OBJECT FOR 3 MINUTES, INTENSITIES I AND II

A, ratio time clear to time blurred plotted against wave-length; B, percentage change in ratio time clear to time blurred plotted against wave-length. The lowest value of power to sustain acuity common to both curves in A is taken as the base on which to calculate percentage change.

variation as it is in photometry and other subjective performances in which an objective check is not possible. As in photometry, carefully tested and practiced observers are needed. The work was done in a dark room. The eye was pre-sensitized to this condition of field by a 50-minute period of adaptation. Constancy of position of the eye was secured by having the observer bite a mouth board on which the impression of his teeth had previously

true. The eye shows better power to sustain its acuity under red light. The ranking from highest to lowest power to sustain for the lower intensity was yellow, yellow-green, orange, red, green, blue-green and blue; for the higher intensity, yellow, yellow-green, orange, red and green. In conducting the test, as has been already stated, a visual angle was selected slightly greater than the minimum for the light giving the lowest acuity. This was

the blue of the spectrum of the lower intensity. Since we wanted to compare the results for the higher and the lower intensity, this angle was used also for the higher intensity. This rendered the test for the work at the higher intensity considerably less sensitive. That is, for this intensity the visual angle was too large to give maximum sensitivity to the test. It also rendered large the scale of ratios time clear to time blurred at the higher intensity.

As we have already stated, the effect of color on power to sustain acuity is very strong. This came out particularly in the comparison of the daylight glass and the Mazda type C lamp with the spectrum colors. For example, the ratio time clear to time blurred for the daylight glass was 71; for the Mazda lamp, 35; and for the yellow of the spectrum, 29.

Figure 4 B gives curves showing the percentage change in speed with change of wave-length for both intensities of light. In these curves percentage change in the ratio time clear to time blurred is plotted against wave-length. In both cases the lowest value of power to sustain which is common to both curves in figure 6 is taken as the base on which to calculate the percentage change. This is the value for green. The percentage change from green to yellow for the lower intensity was 379.5; for the higher intensity it was 475.8.

For various obvious reasons the foregoing curves showing percentage change were not all plotted to the same scale; nor was the same number of observers used throughout. In order to make possible a comparison of the

effect of change in wave-length on the different functions under the conditions tested, figure 5 is given in which the curves are all plotted to the same scale and represent the results of the same observer. These curves are plotted for the lower of the two intensities. In all cases the lowest value for all the functions tested was taken as the base on which to calculate the percentage change. For the lower

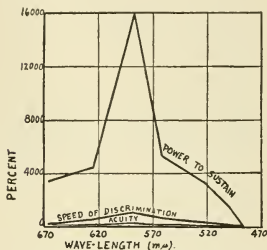


FIG. 5. SHOWING THE PERCENTAGE CHANGE WITH CHANGE OF WAVE-LENGTH OF LIGHT IN ALL OF THE FUNCTIONS TESTED, PLOTTED TO THE SAME SCALE, INTENSITY I.

The value for blue is taken as the base on which to calculate the percentage change.

intensity this was the value for the blue.

An inspection of figure 5 shows that the functions most affected by change of wave-length are in order from greatest to least: the power to sustain acuity, speed of discrimination, and lastly acuity. So far as we have been able to tell from all of our work up to the present time, this order of ranking holds in general for whatever affects the functional powers of the eye:—

errors of refraction, favorableness or unfavorableness of working conditions, bodily health and fatigue, etc. From the standpoint of testing, therefore, the power to sustain acuity affords the most sensitive, and the conventional acuity test the least sensitive basis for detecting small functional disturbances in the eye, whether they be due to errors in refraction or any of the causes mentioned above. Speed of discrimination, however, is a very sensitive test and more feasible for general laboratory purposes than power to sustain.

With reference to the problem of the coloration of paper this study shows that wave-length, hue (which is a subjective aspect both of wave-length and intensity), and saturation (which

is also a function of wave-length and intensity) are important factors governing the working powers of the eye. Further analysis however, is needed. Obviously an important point yet to be determined is the relative significance of hue and saturation. In other words, how much effect is there for difference in color when the working surfaces are equalized in saturation and brightness, and conversely how much effect is there for difference in saturation when hue and brightness are made equal? The first of these conditions will be treated in the next section of the paper. Spectrum lights, it may be noted, when equalized in brightness show quite large differences in saturation.

(Concluded in June number)

News Notes

PERSONNEL RESEARCH FEDERATION

ACTIVITIES OF MEMBER ORGANIZATIONS

Federal Board for Vocational Education

A Directory of Trade and Industrial Schools has recently been published by the Federal Board for Vocational Education. This publication is a complete classified directory of all trade and industrial schools and classes which were federally aided during 1929. It is arranged in two parts. In Part I the information is classified with respect to trades and subjects taught, with the States appearing in alphabetical order under each subject. In Part II the same data are given by States, each State program, classified by types of organization, appearing as a whole.

Industrial Relations Counselors

Unemployment Benefits in the United States by Bryce M. Stewart, published by the Industrial Relations Counselors, Inc., contains a comprehensive analysis of all plans for layoff compensation known to have been or now in operation in the United States up and through the year 1930. It is a factual study of the set-up of these plans, the financial and administrative problems involved, as well as of the actual experience encountered in their operation, and is based on data collected at the source.

The book is divided into two parts, the first part constituting the general discussion of the problem, its statistical phase, the function and efficacy of employment exchanges, and vocational guidance; the factor of public works, regularization by employees and attempts to control the business cycle; the development of unemployment benefit plans, their financial organization and experience; administrative procedure and experience, and legislative efforts to enact un-

employment insurance. A final chapter contains a summary and general conclusions to be drawn in an attempt to evaluate the experience recorded. Part two contains a detailed analysis of each plan, embracing the administrative and financial experience, whether operated by labor unions, companies, or by employer and employees jointly. Published by Industrial Relations Counselors, Inc., 165 Broadway, New York. Price \$7.50.

EXPERIMENTAL EMPLOYMENT OFFICE

The New York State Department of Labor is conducting an experimental employment office at Rochester, New York, which, according to Industrial Commissioner Frances Perkins, "will provide during a period of from three to five years a laboratory for the application of scientific methods to the problems involved in conducting a community public employment service."

Jess T. Hopkins has been appointed director of the office. He was previously personnel director of the Central Hudson Gas and Electric Corporation, with headquarters in Poughkeepsie, as well as president of the Poughkeepsie Industrial Executives' Association.

ILLNESS AMONG WAGE EARNING ADULTS

According to Dean K. Brundage in an article on "Illness Among Wage Earning Adults," concluded in the December, 1930, number of *The Journal of Industrial Hygiene*, analysis of available statistics of morbidity for sample groups of industrial workers in this country showed among other points the following:

1. During the eight years from 1921 to 1928, inclusive, respiratory diseases caused nearly one-half of all the disabilities on account of sickness. The second most im-

portant group of diseases from the standpoint of sickness frequency was the digestive disease group. The contagious and infectious diseases against which public health effort is often so largely concentrated caused only about 3 per cent of the cases.

2. Female industrial workers tend to be absent on account of illness from 50 to 100 per cent oftener than the males, the widest disparity in the rates of the two sexes being for the shorter sicknesses. Considerable difference appears to exist in the relative susceptibility of the two sexes to certain diseases.

3. Married women on the factory payroll of a large rubber company experienced considerably more disability than the single women.

4. In two studies made by the Public Health Service, the excessive use of alcoholic stimulants was found to be most pronounced among the men doing the heaviest, most disagreeable work.

5. A process of selection appears to be going on in certain industries through the quitting of those less well adapted physically to the nature of the work and the working conditions to which they were exposed. Those who tend to remain indefinitely in an industry, especially if it involves some hazard to health, represent a favorably selected group from a health standpoint.

NEW VOCATIONAL GUIDANCE DEPARTMENT

A Vocational Guidance Department has been organized in the Hecksher Foundation, New York, under the direction of Ralph Strathmore. A Bureau of Vocational Information has also been established where information may be obtained on a wide range of professions, businesses, and industries.

UNIVERSITY OF OREGON

According to *School and Society*, "All of the agencies in the University of Oregon dealing with personnel matters are now coordinated under the leadership of a dean of personnel administration responsible directly to the president. This central personnel organization includes the Bureau of Personnel Research, the offices of the dean of men and of the dean of women and the

student employment offices. Outside this immediate organization but coordinated intimately with it are the following agencies, all of large significance in student welfare and guidance: (1) The personnel advisory council, a faculty committee concerned with matters of policy in the development of personnel work, (2) the health service, (3) the placement service rendered by various agencies on the campus, particularly the professional schools, (4) the student advisers, particularly the organized corps of lower division advisers, (5) other living or welfare agencies, such as the housing committee, the administrative group which supervises and regulates student housing, and (6) the various faculty committees and agencies studying problems looking toward the improvement of university service to students. The services last described, it should be understood, are all in addition to those rendered hitherto by the deans of men and women, the academic advisers, and other existing agencies, all of which continue to function substantially as before, though more closely coordinated with each other and with the agencies named above."

A GUIDE FOR AUTHORS

The editorial office of the *Personnel Journal* has on hand a supply of *A Guide for Authors in the Preparation of Manuscript*. Copies of this instructive pamphlet will be mailed on request.

FORTHCOMING MEETINGS

April 30-May 1. TAYLOR SOCIETY, SPRING MEETING. Philadelphia.

May 13-15. INDUSTRIAL CONFERENCE AT PENNSYLVANIA STATE COLLEGE. State College, Pa.

August 23-29. SECOND TRIENNIAL CONGRESS, INTERNATIONAL INDUSTRIAL RELATIONS ASSOCIATION (I. R. I.). The Hague, Holland.

September 9-17. SEVENTH INTERNATIONAL CONFERENCE OF INDUSTRIAL PSYCHOLOGY. Moscow, U. S. S. R.

PERSONAL ITEMS

DR. BEARDSLEY RUMML, who served as the first Director of the Personnel Research

Federation for a few months at the time of its organization ten years ago, has been appointed Professor of Education and Dean of the newly created Social Science Division of the University of Chicago. He continues as a trustee and member of the executive committee of the Spelman Fund of New York. As director of that foundation he has been succeeded by Guy Moffett, from 1923 to 1929 a member of the federal Personnel Classification Board.

GEORGE ALAN WORKS has been appointed to a new personnel office created at the Uni-

versity of Chicago, that of Dean of Students and University Examiner.

V. V. ANDERSON, M.D., Director of Employment, Placement, and Personnel Research of R. H. Macy and Company, has been granted a leave of absence.

C. M. HINCKS, M.D., has become General Director of the National Committee for Mental Hygiene. He succeeds Frankwood E. Williams, M.D., as representative of that organization in the Personnel Research Federation.

Personnel Books

EDITED BY DOUGLAS FRYER

These columns include a reaction against scientific popularization. "The Marks of an Educated Man" is seen by John W. Herring as straining science a bit and "Strategy in Handling People" is criticized by John M. Brewer as a "handbook for the go-getter" rather than sound advice for the improvement of human adjustment. The contribution of science, and of psychology in particular, has never been at its best in broad practical generalizations, but rather in the detailed application of principles and methods. A sound treatment upon business management, according to Mr. Glover, comes into this issue from England and an omnibus writing on the "Science of Work" is contributed from Germany. Professor Swabey shows some interesting side-lights in the philosophy of "The Grand Old Man" of labor. "Briefer Mention" includes news from allied fields of personnel interest and "New Books" lists books published during December and January.

MR. WIGGAM PORTRAYS THE CIVILIZED MAN

THE MARKS OF AN EDUCATED MAN. By Albert Edward Wiggam. Indianapolis: Bobbs-Merrill, 1930, x + 339 pp., \$3.00.

Reviewed by JOHN W. HERRING, *West Chester, Pa.*

This volume comes as a portrait of the temper of the man who wrote the Decalogue of Science. It is the temper of the evangelical preacher rather than the cool scholar. It is broad brush, brave generalization, alliterative epigram, much sound truth, and effective sentiment. It gallops down and athwart the centuries of philosophers, essayists and scientists. It betrays at every turn a veritable genius for collecting pithy and trenchant illustrative material. The book is eminently worth reading for its quotations alone. Mr. Wiggam's description of the educated man is so colorful and runs along a trail so brightly blazed that the reader may wax suspicious. He may ask himself if Mr.

Wiggam isn't pushing things a bit far, carried on the crest of a phrase, when, for example, he writes that an "educated man waits until the evidence is all in" before he permits himself an opinion. The order seems a bit large, particularly when given by one whose courage is as it is in *THE FRUITS OF THE FAMILY TREE*.

The reader, however, will not question that the "Marks of an Educated Man" is an extraordinarily effective popularization of much convincing material. And Mr. Wiggam places himself on the side of the newer angels. If there be flaws in his thinking, or oversimplification in his classifying and captions, it is because he has enlisted so vehemently with the scientists as against

the "tight-minded" man, that he overlooks the shaded areas between white and black. He writes precisely that the line "between the open minders and the tight minders is a sharp, clean-cut, dividing line." There is that in Mr. Wiggam's confidence and resonance of style that seems faintly to beg a question here. Does truth as apprehended by the open-minded man lend itself to quite such vehement statement?

The captions of Mr. Wiggam's thought, "He cultivates the open mind," "He always listens to the man who knows," "He cultivates the habit of success," "Popular notions are always wrong," "It is never too late to learn" sound more like the title page to a certain make of American magazine than clues to the creed of an apostle of the scientific temper. This is of course the license of the popularizer. Any sugar coating will coat as well. One feels in this volume as in its predecessors that Mr.

Wiggam is saying effectively to a wide audience a great many things that need wide hearing. But in setting the book down, one wonders if popularizing does not tend to defeat itself.

The volume concludes with the statement that the educated man "lives a religious life," a "religious life" consisting of a joyful relationship to a world that science enables us to understand. This is a triumphant "mark" to finish with. Only the reader wishes he shared either Mr. Wiggam's optimism about the adequacy of scientific understanding or his faith that an understood world would so surely merit a "joyful" attitude.

Mr. Wiggam has again written a book that perhaps no one else could write, combining as it does his flair for the timely, his unique collector's talent, his propagandist fervor, his vocabulary and his mental agility.

IN ENGLISH TRADITION

EDUCATION FOR BUSINESS MANAGEMENT. By James A. Bowie. London: Oxford University Press, 1930, viii + 200 pp., \$3.25.

Reviewed by JOHN G. GLOVER, *New York University*

It is seldom that one has the privilege of reviewing such a well written book as Dr. J. Bowie's *EDUCATION FOR BUSINESS MANAGEMENT*. It is no doubt a contribution to the modern science of management; however, the principles laid down by Dr. Bowie are not new to the American student of scientific management.

This book is also a desirable contribution to the ever increasing literature in the field of industrial relations. In the first chapter, "Business Development," Dr. Bowie points out that there are not the same chances as in the past for men to use moderate amounts of capital to establish themselves in independent business enterprises, thus the individual is forced into a field of specialization. He further points out that the application of common sense and wit is no longer sufficient for the ever changing tasks, because business is becoming an exercise in constructive thought. Good management involves unity of policy, uniformity of procedure, and consistency of practice.

The chapter on "The New Responsibilities of Management" contains a wealth of valuable information for the modern business manager, because it deals with that relatively new science of handling the human element in industry. Dr. Bowie states, "If supermen are needed anywhere, it is in the sphere of business management, for when 'the captain of industry' turns from a consideration of technical equipment to questions of human management, he passes from the realm of mechanics to that of biology, and biology in its highest and most intricate form. To move freely in this realm, he needs a sound knowledge of the human sciences—sociology, physiology, and psychology—in their bearing on industrial questions. He should be as modern in his outlook and as capable in his methods as the marvellously accurate machines he installs." Then he goes on to make a sweeping but true statement which, in my opinion, sums up the nucleus of our whole industrial problem. "In the onrush of

mechanical progress the tendency has been to forget the worker and his human needs. We have established huge enterprises with national and international markets, owned by widely scattered unknown stockholders, run by a hierarchy of salaried officials, and manned by an array of machine-minders, who too often not only are, but feel themselves to be, nameless numbers on a payroll. We have denied to the worker the opportunity to express his personality in the daily work of hand and brain."

Chapter Three deals with the "Type of Leaders Needed" in our modern mechanized world, wherein the author stresses the need for students of human nature to hold the steering wheel of business and points out that management is a prodigal among professions.

Of special interest in his discussion of "Education for Management," Dr. Bowie points out that, as the average business concern is not equipped to provide the variety of experiences needed by the prospective business manager, lecturers must be recruited from within the plant. This throws the burden upon the busy executive who must now turn his thoughts to lecturing; he may be a poor talker and have very little time or energy to devote to preparation for this particular work. Under this condition, one can readily see that free discussion and criticism would hardly be possible. For this and other reasons, Dr. Bowie recommends that the Universities establish in their curricula a well rounded course in business administration. To quote Dr. Bowie, "It should be a function

and obligation of our Universities to qualify the young men for achievement in every field of human endeavor which requires a high degree of ability, which is of large importance to mankind, and which can be reduced to a teachable basis. Education for management should find its place among our professional schools."

The author sets forth in a clear and concise method the objectives of a college education for prospective business executives. It should be a selector of candidates for business positions, it should train the selected students in the practices of modern business and it should cultivate in these students the ability of analysis and executive decision.

Chapter Five deals with developments in the United States of which we all are familiar. Chapter Six deals with certain peculiarities of British industry which are well worth noting in the light of our own industrial developments. The chapters on "Industrial Administration Curriculum" and "Methods of Instruction" contain a more or less typical outline of what is being already accomplished in our American Universities where business administration forms part of their curricula.

In the light of the recent demands of business executives and the present economic conditions, this book will be found extremely helpful to the student of business management. Although the book is written from an English point of view, the American reader will find that the contents represent what is already common American practice.

ANALYSIS OF EDUCATIONAL JOBS

TRENDS IN EDUCATIONAL OCCUPATIONS. By Marjorie Rankin. New York: T. C., Columbia Univ., (Cont. to Educ. No. 412), 1930, 83 pp., \$1.50.

DEANS AT WORK—DISCUSSIONS BY EIGHT WOMEN DEANS OF VARIOUS PHASES OF THEIR WORK. Edited by Sarah M. Sturtevant and Harriet Hayes. New York: Harper, 1930, xii + 295 pp., \$2.75.

Reviewed by KARL M. COWDERY, *Stanford University*

Education is tackling its problem of job analysis just as are industry, social work and other occupational groups. In the

small volume upon TRENDS IN EDUCATIONAL OCCUPATIONS Miss Rankin presents "an examination of the waxing and waning

occupations in the public school systems of certain cities in the United States from 1898 to 1928." While primarily intended to provide data on what is involved in the educational field for young people considering teaching as a profession, the study actually performs a much wider service. Institutions which are preparing teachers may glean suggestions here as to the markets for their products. Employment and appointment services may be guided in their plans for bringing together employers and candidates for teaching, administrative and allied positions. Educational investigators may find examples of technique for estimating and evaluating present-day phases of educational history. Deans' work is without question the most intensive personnel work known in educational circles. In the book, *DEANS AT WORK*, eight representatives of that occupational group report the outstanding functions and methods of their operations. Previous volumes have given tables of frequency of this and that deaning method, but such job analyses have lacked the human touch and the integrating explanations which reveal how the functions, tools and organizations have met the fundamental problems of individual women in college. Here is more palatable reading in the form of first-hand accounts of what is done and why, and of the observable accomplishments. Each reporter may be "putting her best foot forward," but of such material is made up the "best practices," which, with local modifications to fit peculiar conditions, make for progress in a complicated professional field.

Dr. Rankin in her study of the evolution of education during the past thirty years has secured records from the files of ten large city school systems and four "smaller cities." The data concern 78,713 teachers representing a population area of fourteen and a half million, which, being more than ten per cent of our total population, is reported as representative of conditions in the United States. As to the representative nature of the data there seems little room to take issue if one is thinking in terms of city school systems. But inasmuch as the population of the smallest city on the list

was 14,272 one is tempted to ask, what of conditions in that relatively large number of communities and school districts involving small town and rural environment? An investigation in such areas by similar methods might produce quite different results in respect to the trends reported, and equally significant ones for prospective teachers inasmuch as the smaller localities frequently absorb a large proportion of recently trained teachers.

The content of the book treats of educational occupations under five main headings, (1) maintenance, with 37 occupations; (2) personal service, comprising 44 specialized activities; (3) professional service, involving 29 positions; (4) administration and supervision, with 129 titles; and (5) the main group, the teaching force, a listing of 364 classifications by subject matter. A cross section study of educational occupations in 1928 reports representation according to these five classifications, with subdivision by educational level and the secondary school groups by teaching-subject departments. Similar groupings are used in comparing distributions for 1898, 1908, and 1918. Demand and supply of teachers are contrasted. Demand is represented by 1927-28 distributions of teachers in the 14 cities. Supply appears as the proportion of prospective teachers preparing in each subject-field in two city colleges, Teachers College of Columbia and Hunter College. The use of these two institutions, while doubtless convenient for the study, savors of provincialism when the figures purport to be representative of the whole United States. A saving feature is the brief comparison with data reported from Ohio.

The significant trends include the growth in all classifications and the proportionally rapid growths in the junior and senior high schools. In the secondary schools large numerical and percentage increases are found for English, the trades, and physical education; relative stability in most subjects and administration; but astronomy and geology have practically disappeared.

The results are decidedly significant as far as they go. Data of a more comprehensive population and reference to prob-

lems such as the rapidly growing junior college and the governmentally stimulated agricultural departments would be more completely representative of the teaching profession as a whole.

This well-written and efficiently organized report is commended to counselors, prospective teachers, training organizations, educational investigators, and placement agencies as a sample and, we hope, the fore-runner of much useful information on occupational opportunities and demands.

The analysis of the work of women deans is a study of a specialized vocation in the occupational field of education. The first two chapters, on Office Economy and the organization of "a department of student life," give modern practice and principles, which seem almost universally acceptable. Although fortunate is the dean who can equip herself in the manner recommended and can then function in a modern plant such as is described by Deans Amos of the University of Pittsburgh and Leah Boddie of the New Jersey College for Women. In discussing the physical aspects Miss Amos points out that efficient methods, carefully planned records, and convenient equipment are merely the "means to. . . enrichment of the lives of women students." Dean Boddie then proceeds to report the actual processes of organizing the expression of ideals and principles in practice. The thread of direct contact and personality influence is seen throughout.

Marion A. Brown, Dean of Girls of the University High School of Oakland, California, shows how special forms of the same organizations, equipment and personnel can be applied to the problems of secondary school girls. Another special variation of deans' activities is demanded in such women's professional schools as the Michigan State Normal College at Ypsilanti. Dean Lydia Jones indicates that

initial adjustments and continued constructive interest in broadening programs are a vital necessity.

Worthy prominence is brought to the consideration of vocational guidance problems by Iva L. Peters, Dean and Director of Personnel for Women at Syracuse University. Her thesis is that the vocational guidance function is no exception in deans' work as it calls for specialized training and is too important to be neglected or carelessly delegated. A psychologically trained dean of women may well carry this as her personal activity to serve as the hub around which will revolve many of her more traditionally recognized efforts.

The problems of the academic dean in a women's college are pointed out as involving responsibilities and authority not shared by the other deans of women. But the exposition by Dean Dorothy Stimson of Goucher College suggests that the academic dean who keeps the point of view of the "individualization of students" has little need for a separate social dean provided she has sufficient assistance to express this point of view in both instructional and living organizations.

Dean Irma Voigt of Ohio University describes the successful program of the Y. W. C. A. on and near her campus. The presentation emphasizes the fact that here is an influence for spiritual benefit with which deans may well cooperate. Dean Agnes Wells offers helpful suggestions on costs and other features of residence hall management at the University of Indiana.

The book as a whole offers attractive reading to the young woman looking forward to a possible career as a dean of women and gives many suggestions of successful practices which might be adopted for trial by deans unable to visit other colleges for first-hand observation.

A THROW-BACK IN GUIDANCE

STRATEGY IN HANDLING PEOPLE. By E. T. Webb and J. J. B. Morgan. Chicago: Boulton Pierce, 1930, vi + 260 pp., \$3.00.

Reviewed by JOHN M. BREWER, *Harvard University*

This volume might well be called a handbook for the go-getter. It sets forth in the staccato style of short paragraphs and exciting incident the directions for personal success. These are not different from those in other books: gain attention through a man's special interests; be a good listener; suggest something he would like to do and let him think it is his own idea; compliment people when it will serve your interest; get acquainted with the prejudices of your man and use them to your purpose; make your man want to do what you want him to do; raise his ego; understand his objections and refute them; make his first reaction a favorable one—start him in a series of yes's; shield his vanity; praise your associates and let them have credit; size up your man every way you can, especially when he is off guard; praise a person behind his back—the most effectual kind of flattery; establish a good reputation and get it recognized; have a poker face; extract information painlessly and unconsciously, but if necessary throw up a smoke screen and do not give information yourself; bluff if necessary; don't reveal any doubts; use humor carefully; know when and how to fight; keep calm if the other man fights.

Of course, all this is not stated in this naked fashion; it is dressed up in attractive form and always with great things being done—that is, if you call great such things as landing a big contract, becoming president of the company, and making a million dollars. Yet, one wonders just what the world would be like if all boys and girls were taught these techniques.

The word 'strategy' refers directly to war, having much about it that suggests artifice and deception, and 'handling' suggests that those with whom we deal are to be manipulated to our will. The subtle effect of this book is to suggest that success is won by indirection and influence rather than by

hard work. Now the writings of Samuel Smiles, bad as they are for the modern guidance of children, are full of good deeds; whereas, the modern captains of industry and politics, it appears, are full of great tricks. On page 122 the author actually tells how the German Emperor might have won the war if he had used the methods advocated in this book.

Naturally enough there are many good things in the book, particularly advice about holding one's temper, helping associates, giving credit where credit is due, and learning methods of coöperation. But the continual glorification of the methods of Napoleon, Bismarck, Mussolini, and the great fighters for industrial success in our competitive society cannot be made into a wholesome picture. If there are such things in the world of business and politics as sincerity, mutuality, affection, regard, openness, and frankness, they are not dealt with in this book. "We have no space to consider the moral aspects of building a good reputation" (p. 183).

Probably the young business man of today, on account of rapid changes which are being made in the ethics of occupational life, and on account of the spread of intelligence which makes people less susceptible to suggestion, would make a dismal failure of his life if he patterned it on the principles set forth in this volume. The vocational life which needs to be built, even while retaining its competitive features, is as far above the world described in this book as these descriptions are above the life and doings of the racketeer. If one-tenth of the energy which our great leaders of politics and industry expend in the effort to get ahead of each other were given to the solution of the problem of the business cycle who can doubt but that the social gain from this effort would be greater than which is now achieved.

GERMANY AND THE "SCIENCE OF WORK"

KÖRPER UND ARBEIT, HANDBOOK DU ARBEITSPSYCHOLOGIE. By Edgar Atzler (editor).
Leipzig: Georg Thieme, Verlag, 1927, 770 pp.

Reviewed by DAVID P. BODER, *Lewis Institute, Chicago*

This volume in 8° makes a review, even if delayed, worthwhile. The fifteen articles distributed in three parts, one theoretical and two practical, present almost a complete layout of the possible angles under which the problem can be studied by the natural and technical sciences. It seems that only the social aspect is missing and this probably on purpose. One thing has to be said that although missing in the title, the fatigue aspect is emphasized all through the volume. An enumeration of chapter headings may really serve as a review. 1. Functional Anatomy (Peter). 2. Physiology of the Muscles (Riesser). 3. Sense Organs and Nervous System (Lehmann). 4. Physio-mechanical Aspect of Posture and Movement of the Human Body (du Bois-

Reymond). 5. Circulation and Respiration (Mangold). 6. Metabolism and Transformation of Energy (Atzler). 7. Theory of Fatigue (Durig). 8. Physical Fitness for Work (Lehmann). 9. Racial Biology and Working Ability (Reichel). 10. Physiological Rationalization (Atzler). 11. Fatigue in Industry (Durig). 12. Nutrition of the Working Man (Lehmann). 13. Clothing of the Working Man (Herbst). 14. Sports and Work (Herbst). 15. Work and Pharmacology (Joachimoglu). The majority of chapters carry a large and up to date bibliography. The chapter on Theory of Fatigue seems to cover the field with great detail, but clearly emphasizing the shortcomings of all existing postulates.

GOMPERS THE LABOR PRAGMATIST

THE LABOR PHILOSOPHY OF SAMUEL GOMPERS. By L. S. Reed. New York: Columbia Univ. Press, 1930, viii + 190 pp., \$4.00.

Reviewed by MARIE SWABEY, *New York University*

In a sense the 'labor philosophy' of Samuel Gompers was to have 'no philosophy.' Yet though he was from first to last a practical organizer and man of action rather than a leader in ideas, his common sense convictions about the world and the place of labor in it influenced the American labor movement for some fifty years. While the effect of his leadership was to steer the American Federation of Labor away from interest in ideologies, from the organization of a workers' political party, and from any far-sighted program aiming at the social control of industry, he nevertheless succeeded in establishing trade unionism on a solid basis and in achieving the immediate practical objectives of higher wages, shorter hours, and better working conditions for union members.

In calling attention to the consequences of Gompers' "trade unionism pure and simple" and his prevention of the formation of a labor party in this country, Dr. Reed makes his most interesting point; although many would challenge his further statement that "Abroad labor grows more powerful . . . In this country the labor movement becomes more and more impotent" (p. 7). In this, on the whole, very objective and competent study, Dr. Reed traces the development of Gompers' views from his early conversion to and disaffection with socialism, through his rise to power as a trade union organizer, and his long struggle for trade autonomy and a loose federation of craft unions as against a strongly unified industrial or political unionism.

Behind Gompers' activities lay a simple

laissez faire philosophy, not unlike Herbert Spencer's. Life, he construed as a struggle for survival; and industrialism as a battle among competitive groups in the market place to drive the hardest bargain. Collective bargaining he held to be the most important weapon of the wage-earning class. Yet along with this went belief in the watchwords of individualism: liberty, independence, the right of free contract,

the duty to help one's self, and let the devil take the hindmost. He himself called his view 'Voluntarism' since its main emphasis lay in the advocacy of voluntary institutions in every field of life, and in the avoidance of compulsion by the group. The success of the Federation he attributed to these principles of autonomy, voluntary association, and the independence of each union of the others.

Briefer Mention

RATIONAL ORGANIZATION AND INDUSTRIAL RELATIONS. International Industrial Relations Association. The Hague: 1930, H. Fl. 3.50, 279 pp.

The latest volume issued by the International Industrial Relations Association is a symposium of papers and other material presented at a conference held at Schloss Elmau, Kalis, Oberbayern, June 26 to July 3, 1929. This conference, coming a year later than the first Triennial Congress of the Association at Cambridge, continued the discussion there begun of human relations in the industries of the United States and Europe, but with particular attention to the adjustment of industrial relations to the conditions of scientific management. This central idea is expressed in the general topic "Human Relations in a Rationally Organized Industry."

The conference was participated in by delegates from fourteen European countries, from Australia and from the United States. Topics treated in formal papers include personnel administration in scientifically managed organizations, coöperation between labor and management, scientific determination of daily and weekly working periods, the effect of various kinds of working conditions, and the creative impulses of the workers. The concluding summary was prepared by Mary Van Kleeck of the Russell Sage Foundation, who is a vice president of the International Industrial Relations Association. The papers were originally presented in English, French or German. Translations are included in the report so that the entire proceedings are printed in the three languages.

The International Industrial Relations Association was organized at Flushing, Holland, in June 1925, with the purpose of attracting to its membership persons of various countries interested in improving the human relations in industry. Membership is individual and includes employers, personnel directors, engineers, educators, psychologists, trade union executives, and wage earners.

SPECIMEN OBJECTIVE EXAMINATIONS. By G. M. Ruch and G. A. Rice. New York: Scott, Foresman, 1930, vi + 324 pp., \$1.80.

This book is an outcome of a contest sponsored by the authors in the construction of objective examinations. By objective or new-type examinations is meant those employing such devices as the completion, true-false, matching and similar types. Thirty-six of the best objective tests that were received are contained in this volume, embracing the fields of English, Social Studies, Natural Sciences, Modern Languages, Mathematics, Home Arts, Commercial Subjects and Manual Arts.

THE PSYCHOLOGY OF ACHIEVEMENT. By Walter B. Pitkin. New York: Simon and Schuster, 1930, xi + 502 pp., \$3.50.

Presumably this is one of the so-called self-help books. It is something of psychology, anecdote, biography and philosophy all rolled into one to direct thought toward the value of "achievement," which is defined as "distinguished successful endeavor, usually in the face of difficulties." Its popular appeal is evident; its intent is

realistic and heartening; its wisdom is homely, shrewd and vividly put. The author has no use for the "success cults"; he builds on more solid foundations. He studies energy, interest, emotions, and intelligence; and his psychological depiction of these qualities is distinctly contemporary. Professor Pitkin is seriously concerned to advance the effectiveness of really superior individuals in society and this book is an honest and forceful, if somewhat flamboyant, brief on their behalf. It deserves a wider academic reading than its readability will probably secure for it!

CURRICULUM PROBLEMS IN INDUSTRIAL EDUCATION. By F. C. Smith. Cambridge; Harvard Univ. Press, 1930, ix + 145 pp., \$1.00.

After presenting the accepted methods of building a professional curriculum, the author proposes the elimination of the traditional job analysis made by an expert and the substitution of a "group conference method conducted with competent judges from the fields of industry, education, and organized labor." The author then describes a curriculum made in this way and reports the results secured in one industrial school. It should be remarked that the end which the author has in mind in such a course is not to create or extend manipulative skills, but to give technical and related information essential to the upgrading of the individual in his present employment.

AVIATION AS A CAREER. By J. V. Hanna. New York: Voc. Bull. No. 5, The Young Man and His Career, Kiwanis Club. 1930, 32 pp.

A small pamphlet to enlighten young men in regard to some of the opportunities in the field of aviation. Part I is devoted to "Fields of Opportunity in Aviation" with short paragraphs regarding the development of mail, passenger and express service, photography, control of insects, forest fire patrol, and other occupations in which an airplane is used. Part II is devoted to "occupations in aviation" which gives a short description of the duties and requirements of pilots, mechanics and craftsmen.

WRITING FOR PROFIT. By Donald Wilhelm. New York: McGraw-Hill, 1930, xi + 385 pp., \$3.00.

Mr. Wilhelm writes with the purpose of helping the new author who has to go it alone. His emphasis is upon the practical aspects of telling and selling a story. He quotes, from many editors, vocational advice which is largely of the "uplift" variety. Here and there, however, the anxious writer may find a clue that will guide him in his orientation to the field. Chapters are devoted to newspaper work, magazine articles, syndicates, interviewing, publicity work and advertising, fiction, motion pictures and the talkies, and finally to the newest field of all, writing for the radio. The last chapter gives "a newsroom rhetoric" compiled by The Indianapolis News for its reporters. This is couched in simple language and covers many of the common difficulties faced by the writer whose "writing ear" is untrained or insensitive, and thus should be of service to most of the wielders of the typewriter.

HUMAN NATURE. By Max Schoen. New York: Harper, 1930, xviii + 481 pp., \$2.50.

Psychologists have been accused of making a potentially interesting subject dry. Schoen in a fascinating manner writes this text in terms of everyday experience. Although he covers quite thoroughly the subject matter of Psychology, he probably will be accused by some of being unscholarly. This book can well be recommended to those who desire an interesting and yet scientific treatment of the subject matter of Psychology.

THE AUTOBIOGRAPHY OF A CRIMINAL. By Henry Tufts. Edited by Edmund Pearson. New York: Duffield, 1930, xvii + 357 pp., \$3.

The first edition of this contribution to Americana was printed in 1807, since when the work had disappeared from sight. Edmund Pearson now revives it, with an introduction and some editorial comment, as the first life history of a criminal written in this country. Henry Tuft's criminal career seems largely distinguished by its

failures and the fruits of his activities were often bitter indeed, including a sentence for hanging which was finally remitted. We must suppose that he committed his thefts because he enjoyed the task, whether or not the result was enjoyable, and that he preferred any sort of misadventure to the continuing tedium of domestic life. His wanderings among the Indians, his performance as a deserter during the Revolutionary War, and his frequent and invariably successful encounters with various ladies cast interesting side-lights upon the folkways and beliefs of the times.

SOCIAL PSYCHOLOGY. By B. C. Ewer. New York: Macmillan, 1929, 436 pp. \$2.25.

An elementary and readable exposition of the main concepts of modern social psychology. Ewer attempts to synthesize Allport and McDougall, in spite of their radical differences in viewpoint.

THE MOTIVES OF MEN. By G. A. Coe. New York: Scribner's, 1930, x + 265 pp., \$1.00.

This is a republication in a dollar edition of this popular book upon human motives which was first published in 1928.

CHICAGO. AN EXPERIMENT IN SOCIAL SCIENCE RESEARCH. Edited by T. V. Smith and L. D. White. Chicago: U. of Chicago, 1929, 283 pp.

This book is a guide to all the varied

social science projects which have resulted from the cooperative research organization established at the University of Chicago in 1923. Social maps of Chicago play a large rôle in recording and interpreting data, and several of these are shown in the text. A table is presented which compares two Chicago communities of about the same population. For each community there are data as to land values, numbers of stores and banks, physicians, representation in *Who's Who*, politicians, and rates of divorce, desertion, suicide, poverty and delinquency. There is a directory of publications and of unpublished studies.

REDS AND LOST WAGES. By Charles G. Wood. New York: Harper, 1930, xv + 280 pp., \$4.00.

A Commissioner of Conciliation in the Department of Labor gives some of his first-hand impressions regarding the strikes he has observed during the past twenty years, with a description of the methods by which the Federal Commissioners help to settle industrial disputes. The first part of the book is devoted to the dangers of radical labor leadership; with that out of the way, the author makes useful suggestions for avoiding industrial warfare. He emphasizes the necessity of a permanent clearing house for grievances between employers and employees, either through a labor union or some other body. "What is a fair wage?" he considers to be always an arbitrable question, as are also methods of work and the conditions of work.

New Books

LABOR RELATIONS

INDUSTRIAL RELATIONS IN THE BUILDING INDUSTRY. By William Haber. Cambridge: Wertheim Fellowship Pub'ns., 1930, 612 pp., \$5.00.

LABOR AND LUMBER. By Charlotte Todes. New York: Internat'l Pub., 1931, 208 pp., \$2.00.

THE CHURCH AND INDUSTRY. By Spencer Miller, Jr. and J. F. Fletcher. New York: Longmans, 1930, 286 pp., \$2.50.

MENTAL TESTS AND USES

INTROVERSION AND EXTROVERSION IN THE HIGH SCHOOL; THEIR RELATION TO AGE, SEX, ACADEMIC SUCCESS; AND LEADERSHIP. By R. D. Macnitt. Boston: Badger, 1930, 224 pp., \$2.00.

METHODS OF CORRELATION ANALYSIS (application of statistics to research work). By Mordecai Ezekiel. New York: Wiley, 1930, 427 pp., \$4.50.

TESTS AND INTEREST QUESTIONNAIRES IN

THE GUIDANCE OF HIGH SCHOOL BOYS.
By P. M. Symonds. New York: T. C.,
Columbia Univ. Press, 1930, 69 pp., 75¢.

GUIDANCE (VOCATIONAL AND EDUCATIONAL)

GUIDING THE CHILD TO SUCCESS. By A. M. Emley. Denver: Wm. H. Andre, 1930, 111 pp., \$1.50.

GUIDING RURAL BOYS AND GIRLS; FLEXIBLE GUIDANCE PROGRAMS FOR USE BY RURAL SCHOOLS AND RELATED AGENCIES. By O. L. Hatcher. New York: McGraw-Hill, 1930, 326 pp., \$2.50.

PSYCHOLOGICAL SERVICE FOR SCHOOL PROBLEMS. By Gertrude Hildreth. Yonkers: World B'k., 1930, 330 pp., \$2.16.

THE GUIDANCE OF MENTAL GROWTH IN INFANT AND CHILD. By Arnold Gesell. New York: Macmillan, 1930, 333 pp., \$2.25.

MENTAL HEALTH

ABNORMAL PSYCHOLOGY; ITS CONCEPTS AND THEORIES. By H. L. Hollingworth. New York: Ronald, 1930, 601 pp., \$4.50.

CRIME AND DESTINY (TR. BY CHARLOTTE HALDANE). By Johannes Lange. New York: Paper B'ks., 1930, 250 pp., 50¢.

MANAGEMENT AND ADMINISTRATION

AN EARLY EXPERIMENT IN INDUSTRIAL ORGANIZATION; BEING A HISTORY OF THE FIRM OF BOULTON AND WATT, 1775-1805. By Erich Roll. New York: Longmans, 1930, 336 pp., \$5.00.

BANKING THEORY AND PRACTICE. By Luther Harr and W. C. Harris. New York: McGraw-Hill, 1930, 570 pp., \$4.00.

BUSINESS LETTERS: THEIR PREPARATION AND USE. By H. A. Burd and C. J. Miller. New York: McGraw-Hill, 1930, 512 pp., \$4.00.

DEPARTMENT STORES; RECENT POLICIES, COSTS AND PROFITS. By Emmet Boris. Stanford: Stanford U. Press, 1930, 237 pp., \$4.00.

INDUSTRIAL EVOLUTION. By N. S. B. Gras. Cambridge: Harvard U. Press, 1930, 259 pp., \$2.50.

PROFITABLE DEPARTMENT STORE MANAGEMENT (introd. by Philip Le Boutillier).

H. W. Schacter. New York: Harper, 1930, 219 pp., \$4.00.

SCHOOL PRESS MANAGEMENT AND STYLE. By Lambert Greenawalt. New York: McGraw-Hill, 1930, 420 pp., \$3.00.

THE ART OF BUSINESS REASONING. By H. G. Schnackel. New York: Wiley, 1930, 320 pp., \$3.50.

THE RETAIL EXECUTIVE; HIS PREPARATION AND TRAINING. By Thorndike Deland and E. A. Raisbeck, Jr. New York: Harper, 1930, 218 pp., \$3.00.

VOLUNTARY CHAIN STORES, AND HOW TO RUN THEM. By Craig Davidson. New York: Harper, 1930, 361 pp., \$5.00.

ADVERTISING AND PUBLICITY

COPY TECHNIQUE IN ADVERTISING. By Richard Surrey. New York: McGraw-Hill, 1930, 297 pp., \$4.00.

MODERN ADVERTISING ART (FOREWORD BY E. E. CALKINS). By Frank H. Young. New York: Covici, Friede, 1930, 199 pp., \$7.50.

PROBLEMS IN RETAIL DISTRIBUTION. By N. P. McNair and C. I. Gragg. New York: McGraw-Hill, 1930, 557 pp., \$5.00.

TYPOGRAPHIC DESIGN IN ADVERTISING. By L. B. Siegfried. Wash.: United Typothetae of Amer., 1930, 128 pp., \$2.25.

WHO'S WHO IN ADVERTISING, 1931. By J. L. Rogers, ed. New York: Harper, 1931, 300 pp., \$7.50.

SOCIAL WORK

A CHANGING PSYCHOLOGY IN SOCIAL CASE WORK. By V. P. Robinson. Chapel Hill: U. of N. C., 1930, 221 pp., \$2.50.

VOCATIONAL INFORMATION

EXPERIMENTAL ELECTRICITY. By R. H. Walters. New York: McGraw-Hill, 1930, 145 pp., \$1.50.

PRINTERS' MARKS AND THEIR SIGNIFICANCE. By D. C. McMurtrie. Chicago: Eyncourt, 1931, 29 pp., \$1.25.

PUBLISHING AND BOOKSELLING; A HISTORY FROM THE EARLIEST TIMES TO THE PRESENT DAY; WITH A BIBLIOGRAPHY BY W. H. PEET. By F. A. Mumby. New York: Bowker, 1931, 480 pp., \$6.00.

TEACHING THE USE OF BOOKS AND LIBRARIES; A MANUAL FOR SCHOOL LIBRARIANS AND CLASSROOM TEACHERS, TO ACCOMPANY THE LIBRARY KEY. By May Ingles and Anna McCague. New York: Wilson, 1930, 198 pp., \$1.80.

THE BUSINESS OF WRITING. By F. W. Ziv. Cincinnati: Writer's Digest, 1930, \$2.00.

THE FUTURE OF FARMING. By C. S. Orwin. New York: Oxford, 1930, 160 pp., \$2.00.

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PREPARED BY LINDA H. MORLEY, *Industrial Relations Counselors, Inc.*

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